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January 17, 2018

Mr. Davis Zhen, Project Coordinator  
U.S. Environmental Protection Agency  
1200 6th Avenue  
Seattle, Washington 98101

Subject: **Portland Harbor Superfund Site**  
**Pre-Remedial Design (Pre-RD) Investigation and Baseline Sampling**  
**Surface Sediment Field Sampling Plan**  
**CERCLA Docket No. 10-2018-0236**

Dear Mr. Zhen:

On behalf of the Pre-RD AOC Group, AECOM is pleased to submit the Surface Sediment Field Sampling Plan (FSP) in accordance with the Administrative Settlement Agreement and Order on Consent (ASAOC) for Pre-RD Investigation and Baseline Sampling.

The attached document describes the activities to be performed in compliance with the Statement of Work Section 3.1 “Scope of Pre-Remedial Design Investigation (PDI)” and Section 5.7(c) “Supporting Deliverables to PDI Work Plan” approved by the U.S. Environmental Protection Agency (EPA) as part of the ASAOC.

We understand the EPA has 30 days to review the attached document. In the interest of expediting the project, we encourage a meeting to assist with a timely review and approval process.

Again, on behalf of the Pre-RD AOC Group, we are pleased to submit the referenced document and look forward to assisting in the review process.

Sincerely,

Kenneth M. Tyrrell  
AECOM Project Coordinator  
Executive Vice President  
(281) 224-2793

Copies: Pre-RD AOC Group, Mr. Hans Feige

# **AGENCY REVIEW DRAFT**

## **Surface Sediment Field Sampling Plan**

**Portland Harbor Pre-Remedial Design  
Investigation and Baseline Sampling  
Portland Harbor Superfund Site**

AECOM Project Number: 60554349  
Geosyntec Project Number: PNG0767A

January 17, 2018

*Prepared for:*

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*On behalf of:*

Portland Harbor Pre-RD AOC Group  
Portland, Oregon

*Prepared by:*



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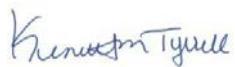
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## CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



January 17, 2018

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Kenneth M. Tyrrell  
PDI Project Coordinator  
AECOM Technical Services

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Date

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## ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
AECOM	AECOM Technical Services
ALS	ALS Environmental in Kelso, Washington
ASAOC	Administrative Settlement Agreement and Order on Consent
ASTM	American Society for Testing and Materials
BL	baseline/stratified random samples
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COCs	contaminants of concern
CRD	Columbia River Datum
CSM	Conceptual Site Model
D/U Reach	the Downtown Reach and the Upriver Reach
DDx	dichlorodiphenyltrichloroethane and its derivatives
D/F	dioxins/furans
DGPS	differential global positioning system
DQOs	data quality objectives
DSL	Oregon Department of State Lands
EPA	United States Environmental Protection Agency
FC	Field Coordinator
FS	feasibility study
FSP	Field Sampling Plan
Geosyntec	Geosyntec Consultants, Inc.
Gravity	Gravity Marine Services
ID	identification number
LWG	Lower Willamette Group
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PDI	Pre-Remedial Design Investigation
PHSS	Portland Harbor Superfund Site
Pre-RD AOC Group	Pre-Remedial Design AOC Investigation Group
Pre-RD	Pre-Remedial Design
PRP	potentially responsible party
PSEP	Puget Sound Estuary Program
QA	quality assurance
QAPP	Quality Assurance Project Plan

QC	quality control
QC	quality control
RB	rinsate blank
RI	remedial investigation
RM	river mile
ROD	Record of Decision
SG	surface sediment grabs
Site	Portland Harbor Superfund Site
SMA	sediment management area
SOP	Standard Operating Procedure
SOW	Statement of Work
SWAC	surface weighted average concentration
TB	trip blank
TestAmerica	TestAmerica Laboratories
TOC	total organic carbon
UR	D/U Reach samples

# **1. INTRODUCTION**

The Record of Decision (ROD) described a post-ROD sampling effort for the Portland Harbor Superfund Site (Site or PHSS; Figure 1) located in Portland, Oregon, to delineate and better refine the sediment management area (SMA) footprints, refine the Conceptual Site Model (CSM), determine baseline conditions, and support remedial design (United States Environmental Protection Agency [EPA] 2017a). Geosyntec Consultants, Inc. (Geosyntec), and AECOM Technical Services (AECOM) submitted a detailed Work Plan for Pre-Remedial Design Investigation and Baseline Sampling (PDI) on behalf of a group of industrial parties called the Pre-Remedial Design Agreement and Order on Consent Investigation Group (Pre-RD AOC Group). On December 19, 2017, EPA entered into an Administrative Settlement Agreement and Order on Consent (ASAOC) with the Pre-RD AOC Group to conduct the PDI studies at the Site (EPA 2017b). The ASAOC includes a Statement of Work (SOW) and the PDI Work Plan (as an attachment to the SOW), which generally describe the agreed upon field investigation activities, data analyses, schedule, and deliverables for the PDI.

These PDI studies are a foundational step in what will be a multi-phase effort to update current conditions from the collection of data during the remedial investigation (RI)/feasibility study (FS). The RI/FS was initiated by a group of potentially responsible parties known as the Lower Willamette Group (LWG) and completed by EPA in 2016 (EPA 2016a, 2016b). The RI consisted of three rounds of data collection, including surface and subsurface sediment, bank soils, surface water, sediment traps, porewater, fish tissue, and other media from 2001 through 2007.

This Field Sampling Plan (FSP) was prepared to support the surface sediment sampling efforts outlined in the PDI Work Plan (Geosyntec 2017) and the project Quality Assurance Project Plan (QAPP) (AECOM and Geosyntec 2018a). To the extent practicable, previously approved FSPs from the RI will be referenced.

## **1.1 Project Setting**

The PHSS is located in Portland, Oregon, on the lower Willamette River immediately downstream of the urban downtown area from river mile (RM) 1.9 upstream to 11.8 and covers 2,190 acres. There are two reaches located immediately upstream of the Site. The Downtown Reach, which includes the urbanized area of downtown Portland, is defined by EPA as extending from RM 11.8 to RM 16.6. EPA defines the Upriver Reach as extending from RM 16.6 to RM 28.4. Collectively, RM 11.8 to RM 28.4 is referred to as the D/U Reach.

## **1.2 Project Overview**

Two kinds of surface sediment data will be collected within the Site: 1) random stratified samples within a grid system (for establishing a new baseline dataset); and 2) targeted (non-random) samples located in SMA areas to support further refinement of the SMA footprints.

Additional surface sediment samples may be collected to reoccupy 2004 RI surface sediment locations. If this reoccupation of 2004 RI sampling activity was to occur, the same protocols would be followed outlined in this FSP and the description of the sampling activities would be developed as an addendum to this FSP.

Surface sediment will be collected from 0- to 30-centimeter depths, consistent with the RI. Additionally, surface sediment samples will be collected from the D/U Reach. The D/U Reach stations will be located in sediment areas targeting fine-grained sediment and higher total organic carbon (TOC), generally similar to surface sediment within the Site; target ranges are discussed in Section 2.1.4.

Baseline surface sediment samples will be analyzed for the ROD contaminants of concern (COCs). Surface sediment samples from targeted (non-random) stations will be analyzed for the focused COCs, which include dichlorodiphenyltrichloroethane and its derivatives (DDx), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and dioxin/furans (D/F). All stations will be analyzed for grain size and TOC, and a portion of the fine-grained samples may be selected for Atterberg Limits geotechnical testing.

### 1.3 Data Quality Objectives

The stratified random surface sediment sampling effort, in conjunction with surface water and fish tissue data, will be used to update the current conditions for the full ROD suite of COCs (see ROD Table 17, relisted in Table 3 of the PDI Work Plan) and will provide a baseline for long-term monitoring and remedy effectiveness evaluations. The SMA surface sediment sampling effort, along with baseline sampling, will help refine the CSM for the Site. Data quality objectives (DQOs) for surface sediment sampling are detailed in Table 2 of the project QAPP (AECOM and Geosyntec 2018a).

## 2. SAMPLING DESIGN AND APPROACH

This FSP has been prepared to ensure DQOs are met. Methods for surface sediment sampling are consistent with EPA-approved sampling plans from the RI (Integral Consulting [Integral] 2002, 2004, 2006), EPA guidance on collecting sediment data (EPA 2014), and Puget Sound Estuary Program (PSEP) protocols (PSEP 1996).

### 2.1 Surface Sediment

Two kinds of surface sediment data will be collected within the Site: stratified random samples within a grid system to establish a baseline dataset and targeted (non-random) samples located in SMA areas to support further refinement of the SMA footprints. All surface sediment sampling stations within the Site are presented in Figure 2. In addition, upriver surface sediment data will be collected to evaluate current conditions and incoming contaminant loads. All surface sediment

samples will consist of a three-point composite. At each proposed station, three “grabs” will be collected within a relatively small footprint and composited into one sample for analysis.

### 2.1.1 Stratified Random Sampling

A total of 428 sediment samples will be collected for this DQO. The gridded random stations will be applied throughout the Site, including areas where other parties are collecting post-RI data. All surface sediment sample types, numbers, and analyses are summarized in Table 1. Section 3.2.2 of the PDI Work Plan details the rationale and statistical justification for the stratified random sampling design. In summary, the total sample count reflects the number of samples required to improve upon the level of variability in the 2004 surface weighted average concentrations (SWAC) and to enable the design to statistically detect differences ( $\alpha = 0.05$ ) between 2004 SWACs and current SWAC estimates with an approximate 80% level of statistical power. The dataset will be used to establish a baseline for future long-term monitoring. All stratified random surface stations will be analyzed for the full ROD Table 17 suite of COCs, plus grain size and TOC (see Section 5 for details).

Combined with the SMA samples (see below), this sample design represents the estimated 666 surface sediment sampling stations needed to yield a statistically robust new dataset for determining SWACs at varying scales.

### 2.1.2 Targeted SMA Delineation

A total of 178 targeted surface sediment sample stations will be collected to support further refinement of the SMA footprints. In addition, 60 surface grab samples will be co-located with the 60 deep in-water core stations in SMA areas. . The proposed sample placement density within/adjacent to the SMAs is approximately 290 to 300 feet between each sample.

### 2.1.3 Downtown/Upriver Reaches

A total of 30 surface sediment samples will be collected from the Downtown Reach located immediately upstream of the Site, and 30 surface sediment samples will be collected from the Upriver Reach. All D/U locations will target fine-grained sediments with total organic carbon in an attempt to match TOC and fine-grained sediments within the Site sediments.

Proposed locations are presented in Figure 4. A review of previous sediment studies’ available grain size data and bathymetry data was conducted to select initial target areas in the D/U Reach (RI/FS database; GSI Water Solutions, Inc. [GSI] and Hart Crowser 2010; GSI 2014; Kleinfelder 2015; Hart Crowser 2002). Samples were randomly placed in areas with more than 50% fines (sum of clay and silt fractions, defined as material passing through a #200 sieve for American Society for Testing and Materials [ASTM] grain size). Figure 3 presents the available percent fines data in the D/U Reach, and Figure 4 presents randomly placed proposed locations based on the initial desktop study. However, the actual collection locations will be selected based on confirmation of sufficient fine-grained sediment and TOC presence (see below).

## 2.1.4 Pre-Screening D/U Sediments for Grain Size and TOC

It is critical that D/U samples have grain size and TOC fractions similar to Site conditions, so they can be representative comparisons to the Site. In addition, cleanup levels for organic sediment COCs in the ROD are dry weight based values (i.e., not normalized for organic carbon content); therefore, TOC is required to be within the range of Site conditions for concentrations of organic chemicals in D/U sediments to be evaluated within the context of cleanup levels for the Site. The average and median site-wide TOC is 1.8% with a distribution range of 0.04 to 27 percent. The mean grain size distribution of site surface sediments is classified as a sandy silt. The average upriver TOC concentration is 1.1 percent with a range of 0.033 to 13 percent depending on the river reach. The TOC distribution in the Downtown Reach appears to be different from the upper reaches, especially from RM 22.7 to 28.4 where the sediment facies may be different. The historical data do not always show high correlation between percent fines and TOC; therefore, screening visually only for grain size will not be adequate to determine if TOC fractions are appropriate. Both parameters will be evaluated.

**Visual Reconnaissance.** A field reconnaissance survey will be conducted prior to sampling to confirm a target area containing fine sediments. First, the sediment bottom will be probed using a steel-tipped rod to confirm the presence of fine-grained sediments in expected areas. Best professional judgement can easily distinguish between predominantly coarse-grained material (sand and gravel) versus predominantly fine-grained material (silt and clay, and up to some sand). Second, an aliquot of mud will be collected and the sediment grain size fractions will be visually classified according to ASTM visual-manual soil classification methods for particle size (e.g., cobbles, rocks, silt, sand). Visual inspections will include recording of the presence/absence of organic matter, organic silt, leaf litter, roots, rootlets, and other organic matter that may indicate the presence of TOC. Third, areas containing an estimated > 35% fines and presence of organic matter will be mapped and sampled. The 60 proposed locations will be re-randomized, if necessary.

**Data Screening.** Surface sediment samples will be collected, processed, and packaged (as described below) from areas visually identified above. Full sets of samples and jars will be submitted to the designated analytical lab for a quick turnaround analysis of TOC by EPA Method 9060 and grain size by ASTM. Grain size analysis will include both the coarse- and fine fraction estimation of the sample (sieves and hydrometer), including determination of silts and clays.

The target range for TOC follows:

- No sample will be collected/analyzed < 0.5% TOC.
- Target range for TOC is +/- 0.7% around the site-wide mean of 1.8% (between 1% and 2.3%) based on the distribution of site data.
- If TOC is > 8%, then site conditions will be evaluated before accepting the sample.

The target range for grain size fractions follows:

- No sample will be collected/analyzed < 35% fines.
- Some clay is present.
- The nature of the silt and clay fractions is evaluated, with a target of organic silt and non-mineral clay fractions; this may require additional analysis.

**Data Evaluation and Analysis.** Once laboratory TOC and grain-size fractions are confirmed to be within the targeted range, a subset of samples will be analyzed for Atterberg Limits testing to further classify fine-grained sediments. Spatial patterns and correlations among results will be evaluated. After this evaluation, remaining samples deemed to be appropriately representative of site conditions will be analyzed for the full suite of ROD Table 17 COCs. In the event that a sample(s) is not within the acceptable range (both components are important), these sample location(s) will not be analyzed without further discussion with the Pre-RD AOC Group and EPA. A sample may be analyzed if it is above the minimum TOC requirement, or below the maximum, or an alternate station may be selected in the field and resampled.

## 2.2 Sample Identification

### 2.2.1 Sample Types, Locations, Depths

Consistent with the previous RI/FS protocol, surface sediment samples will be collected from 0 to 30 centimeters. Proposed surface sediment sample stations within the Site are provided in Figure 2 and in the D/U Reach in Figure 4. Sample location coordinates and sample identification numbers (IDs) are provided in Table 2. All surface grab samples will be collected as three-point composites with a hydraulic power grab sampler (see Section 4.3 below for more details).

Additionally, two alternative stations for the stratified random samples are provided in Figure 5 and Figure 6. Stations were re-randomized within each grid, using the same approach as the parent sample (see Section 4.4 below for more details on the rationale for selection of the two alternative stations).

### 2.2.2 Sample Nomenclature

Sample nomenclature will be developed in a manner similar to the RI Round 1 FSP (Integral 2002, Section 4.2). In brief, all samples will have a unique identifying sample ID that includes the following:

- Project phase (PDI).
- Sample matrix (SG [sediment grab]).
- Sample Area (B for baseline/stratified random samples and D/U Reach). All baseline sample stations will be numbered B001 through B428 and D/U Reach stations will be

numbered B429 through B489 (N=60). All SMA or in-water core location stations will be numbered sequentially S001 through S168 (N=178). All surface sediment sample locations are numbered sequentially from downstream to upstream.

- Unique, sequential station number (001 to ### per sample area).

For example, a surface grab sample from the 428th stratified random sampling location would have the sample ID PDI-SG-B428. See Section 4.2.1 of the QAPP for nomenclature associated with field duplicates and other quality assurance (QA)/quality control (QC) samples. Additional data fields that describe each unique sample features, location, composite type will be recorded in the field forms and will be included in the project database, as described in the project Data Quality Management Plan (DQMP).

## 2.3 Sampling Schedule

The overall project schedule is outlined in the PDI Work Plan (Geosyntec 2017). Surface sediment grab sampling is targeted for First Quarter of 2018. EPA will be notified 1 to 2 weeks prior to sampling. Surface sediment sampling is expected to last 2 months using two sampling vessels. About 1 month into the program, progress will be assessed and, if it appears that the sampling effort is behind schedule, a third boat and crew will be mobilized to complete the sampling in the targeted 2-month period.

## 3. PROJECT ORGANIZATION/FIELD TEAM

### 3.1 Team Organization and Responsibilities

Team organization is detailed in the PDI Work Plan and in Section 2 of the QAPP (AECOM and Geosyntec 2018a). As it relates to this FSP, AECOM and Geosyntec are coordinating activities including management of all subcontractors, field sampling, analysis, and reporting scoping tasks. The PDI Project Coordinator, Mr. Ken Tyrrell, and PDI Project Manager, Dr. Jennifer Pretare, PhD (AECOM), will be responsible for overall project coordination and providing oversight on all project deliverables. Ms. Anne Fitzpatrick (Geosyntec) is the project's senior technical lead for this task. Ms. Nicky Moody (AECOM) and Mr. Keith Kroeger (Geosyntec) will be the Project Field Coordinators (FCs) and will be generally responsible for general field QA/QC oversight. The project chemists, Ms. Julia Klens-Caprio (Geosyntec), Ms. Amy Dahl (AECOM), and Ms. Karen Mixon (AECOM), will be responsible for coordination with labs regarding sample volumes, logistics, schedule, detection limits and matrix interferences, and ensuring overall data quality.

Gravity Marine (Gravity), of Fall City, Washington, will perform vessel support, with Shawn Hinz acting as a point of contact. Analytical laboratories include ALS Environmental (ALS) in Kelso, Washington, and TestAmerica Laboratories (TestAmerica) in Fife, Washington, Sacramento, California, and Knoxville, Tennessee.

### **3.2 Communication/Information Flow**

The communication strategy is outlined in Section 2 of the QAPP (AECOM and Geosyntec 2018a). In brief, the Field Coordinators, Ms. Nicky Moody (AECOM) and Mr. Keith Kroeger (Geosyntec), will be the points of contact for field staff during the implementation of this FSP. Anne Fitzpatrick (Geosyntec) will be the senior technical lead for this task. Deviations from this FSP or the project-specific QAPP will be reported to Dr. Pretare, the PDI Project Manager, for consultation. Significant deviations from the FSP/QAPP will be further reported to representatives of the Pre-RD AOC Group and EPA by the PDI Project Coordinator.

### **3.3 Coordination with EPA**

The PDI Project Coordinator will notify the EPA Project Manager 1 to 2 weeks prior to beginning any field activities so that EPA can schedule any oversight activities required. The PDI Project Coordinator will also notify the EPA Project Manager once field activities have been completed.

Split samples for chemical analyses can be provided to EPA upon its request. EPA's Project Manager should contact the PDI Project Coordinator to coordinate this activity and determine appropriate logistics. If EPA elects to collect split samples, collection at stations where blind field duplicates are taken is recommended so that EPA's comparison samples can be evaluated relative to the field and analytical variability measured by the project team.

## **4. SAMPLE COLLECTION PROCEDURES**

The following sections describe the procedures and methods that will be used during surface sediment sampling, including sampling procedures; recordkeeping; sample handling, storage and shipping; and field quality control procedures. All field sampling activities will follow procedures outlined in the project Health and Safety Plan (AECOM and Geosyntec 2018b)

### **4.1 Sampling Vessels and Equipment**

Gravity will perform the surface sediment sampling activities. Gravity will utilize two sampling vessels, RV *Cayuse* and RV *Tieton*, equipped with hydraulic power grab samplers to complete the work. Both vessels have a virtual anchoring system that incorporates an autopilot and two small motors to keep the vessel on station without needing to set fixed anchors. The RV *Cayuse* is a 26-foot research vessel with landing craft design, crew cabin, and forward working area. The vessel has an A-frame with a custom research winch and dynamic positioning system. The RV *Tieton* is a 34-foot research vessel with landing craft design and crew cabin, pilot house, and forward working area. The vessel has an A-frame with custom research winch and dynamic positioning system. Supplemental vessels are available if additional or backup support for in-water sampling is needed. All vessels will be mobilized from Swan Island Launch.

Equipment and supplies will include all equipment for positioning, sampling, processing, recording, and shipping samples. Sample containers and preservatives, as well as coolers and packing material, will be supplied by the analytical laboratory. An equipment checklist is provided in Appendix A.

## 4.2 Station Positioning and Vertical Control

Station positioning and vertical control will be performed as outlined in detail in the RI Round 1 FSP (Integral 2002). A differential global positioning system (DGPS) unit will be used to confirm the horizontal sampling locations to an accuracy of 1 to 2 meters. The DGPS accuracy will be confirmed each morning and evening to a known land-based survey point. Confirmed station locations will be recorded to the nearest whole foot in North American Datum 1983 (NAD83) Oregon State Plane North datum.

Vertical control will be established using an on-board fathometer or lead line to measure depth to mudline at sampling locations. Water depths will be converted to elevations in feet North American Vertical Datum of 1988 (NAVD88) based on the river stage at the time of sampling as recorded at the Morrison Street Bridge located at RM 12.7. Water levels will be recorded to the nearest one tenth of a foot in the datum specified in the DQMP (AECOM and Geosyntec 2018c). Further details are provided in Section 5.2 of Integral (2002).

## 4.3 Sample Collection and Processing

In general, sample collection will be performed as described in the RI Round 1 FSP (Integral 2002), RI Round 2 FSP for Sediment Sampling and Benthic Toxicity Testing (Integral 2004), and the RI Round 3 FSP for Upstream and Downstream Sediment Sampling (Integral 2006) with modifications described herein. Key changes from the RI Round 1 FSP include the following:

- Samples will be collected as three-point composite samples.
- Sediment will be collected from 0 to 30 centimeters (consistent with the Round 2 and Round 3 FSPs).
- Samples will be processed on the sampling vessel. Samples will be transported in coolers on ice to the field lab for sample packaging and shipment. The AECOM Sample Processing Facility at 1116 SE Caruthers Street, Portland, Oregon, is approximately 20 blocks from the Site and will be used as a base for staging work, core sample processing, sample storage, sample packaging and shipping, daily field team meetings, gear storage, decontamination, and other field support needs.

Section 5.6.1 of Integral (2002) provides additional details on sampling and record keeping. Standard Operating Procedures (SOPs) from the RI will be followed. The SOPs are from Appendix E of the LWG FSP for RI Round 2 (Integral 2004) and are consistent with Appendix D of the LWG FSP for RI Round 3 (Integral 2006), which was previously approved by EPA. These SOPs include lists of needed supplies and equipment and SOPs for equipment

decontamination, sediment sample collection, sediment sample processing, chain-of-custody, packaging, and shipping samples. The SOPs will be available in hard copy and on the project SharePoint site for easy access by the field crews.

The hydraulic power grab samplers (similar to a van Veen grab sampler but with power-assist) will target collection of sediment from the upper 0 to 30 centimeters of sediment at three sampling points at each sample location (without adjusting vessel position); the three grab samples will be composited into a single sample for analysis. The three-point composite sample will be collected within a relatively small footprint around the sampling vessel (i.e., less than 25 feet). For example, grab #1 will be deployed, accepted, and processed on the deck of the vessel. The sampling vessel's overhead winch may pivot 5 to 10 feet from the original sample location, and the process will be repeated until there is an equal volume of sediment from the three grabs.

In general, the volume of sediment from the three surface grabs will be homogenized until uniform in color and texture, as described in more detail in Section 5.6 of RI Round 1 FSP (Integral 2002), Section 4.6 of RI Round 2 FSP (Integral 2004), and Section 5.6 of RI Round 3 FSP (Integral 2006). Sediments will be collected from the hydraulic power grab using a stainless-steel spoon, avoiding sediments in contact with the sides. Large organisms and pieces of debris will be removed and noted in the sample log sheet. Acceptance criteria include the following (PSEP 1996; Integral 2004):

1. No or minimal excess water leaking from the jaws of the sampler.
2. No excessive turbidity in the overlaying water of the sampler.
3. Sampler did not over-penetrate.
4. Sediment surface appears to be intact with minimal disturbance.
5. Program-specific penetration (30 centimeters) has been achieved.

After sample acceptance, the sediment will be placed in a large, stainless-steel bowl for homogenization. Once the volume of sediment from each grab has been homogenized to a uniform consistency and color, composited sediments will be visually described following American Society for Testing and Materials visual-soil classification procedure in the field log book. Sediments will be placed in the appropriate laboratory-provided sampling containers and stored in a cooler at 4 degrees Celsius (°C) until transport to the laboratory.

#### 4.4 Contingency Plan for Field Condition Impediments to Collecting Samples

During the sediment grab sampling efforts, the field crew may encounter field conditions that preclude collection of grab samples at the planned stations (e.g., limited access, poor recovery, safety concerns, debris/rock/bedrock causing refusal). A total of three attempts will be made to

relocate the sample to an area within a 25-foot radius of the planned station.<sup>1</sup> If an acceptable sample cannot be obtained within 25 feet, sample collection from within a 25-foot to 50-foot radius will be attempted.

For stratified random sample locations, if a sediment grab sample cannot be collected from within 50 feet of the target location due to inaccessibility or three failed grab attempts, re-randomized Alternate Location 1 (Figure 5) may be attempted in coordination with the PDI Project Coordinator and EPA. If Alternate Location 1 is inaccessible or three failed grab attempts occur, re-randomized Alternate Location 2 (Figure 6) may be attempted in coordination with the PDI Project Coordinator and EPA. Sample location coordinates for Alternate 1 and Alternate 2 are provided in Tables 3 and 4, respectively. Alternate sampling locations were re-randomized using a GIS randomization program to maintain the geostatistical methods used during development of the PDI Work Plan (Geosyntec 2017).

For SMA target locations, the radius protocol described above will be used. The re-randomization geostatistical methods are not necessary for the SMA locations as a means to address as a contingency plan. In the event that field conditions preclude the field crews from collecting proposed target samples within SMAs, attempts from within a 25-foot to 50-foot radius will be continued until an acceptable grab is obtained.

#### 4.5 Sample Handling and Transport

Chain-of-custody procedures will be followed as detailed in the RI Round 1 FSP (Integral 2002) and similarly described in the RI Round 2 FSP and RI Round 3 FSP (Integral 2004 and 2006). Samples will be stored on ice at 4°C in a field cooler and shipped to appropriate laboratories as detailed in the RI Round 1 FSP (Integral 2002) and similarly described in the RI Round 2 FSP and RI Round 3 FSP (Integral 2004 and 2006). Sections 4.8.1 and 4.8.2 of the RI Round 2 FSP, along with the SOPs in Appendix E of the RI FSP for Round 2 (Integral 2004) and Appendix D of the RI FSP for Round 3 (Integral 2006), provide additional details on custody, storage, and shipping details, respectively. Additional details are provided in Section 4.3 of the QAPP (AECOM and Geosyntec 2018a).

#### 4.6 Field Logbook and Forms

All field activities will be recorded in a field logbook as outlined in detail Section 5.3 of the RI Round 1 FSP (Integral 2002). Field forms (Appendix A of this FSP) will be completed as outlined in detail in the RI Round 1 FSP (Integral 2002).

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<sup>1</sup>Distances proposed in this FSP were based on previous sediment project experience in EPA Region 10.

## **4.7 Decontamination Procedures**

Equipment decontamination procedures will be performed as outlined in detail in the Round 1 FSP (Integral 2002) and provided in the RI Round 2 FSP Appendix E Sediment Sampling SOP (Integral 2004). This SOP is consistent with the RI Round 3 FSP Appendix D Sediment Sampling SOP (Integral 2006). Decontamination of field sampling equipment will occur between stations. For composite sub-stations from which a composite sample will be generated, the grab sampler will be rinsed/sprayed with river water until all solid material is removed. New sampling spoons will be used per sub-station. In summary, the decontamination steps will include an initial rinse with vessel river water to dislodge particles, a scrub with brush and Alconox™ or other phosphate-free detergent, and then a rinse with deionized water. Additional rinses with nitric acid or methanol are not anticipated but may be considered based on sample conditions (e.g., excessive oily/tar residue). Rinses using nitric acid or methanol will be handled and disposed of according to RI Round 2 FSP Appendix F SOP. Sampling spoons and bowls will be covered with aluminum foil until use (dull side down).

## **4.8 Investigation-Derived Waste Disposal**

Investigation-derived waste disposal will occur as described in the RI Round 1 FSP (Integral 2002, see Section 5.7). In general, any excess water or sediment remaining after processing will be returned to the vicinity of the collection site. Any water or sediment spilled on the deck of the sampling vessel will be washed into the surface waters at the collection site before proceeding to the next station. Phosphate-free detergent-bearing liquid wastes from decontamination of the sampling equipment will be washed overboard or disposed into the sanitary sewer system.

Tyvek, gloves, paper towels, plastic sheeting, and other waste material generated during sampling will be placed in heavyweight garbage bags or other appropriate containers and placed in normal refuse containers for disposal at a solid waste landfill.

## **4.9 Field Quality Control**

All QA/QC procedures are detailed in the QAPP (AECOM and Geosyntec 2018a). Requirements for QA/QC samples are provided in Table 5, and a summary of all field QA/QC sample numbers is provided in Table 6. In brief, homogenized blind field duplicates will be collected from the same composited bowl of homogenized sample on 5% of the samples to assess variability within samples. Other field QC samples, such as trip blanks, temperature blanks, and rinsate blanks, will be collected per sampling vessel (as needed) as outlined in Section 4.6.1 of the QAPP.

# **5. LABORATORY ANALYSIS**

With the large numbers of samples and multiple analytes, it is best to separate the sample analyses among laboratories that specialize in certain analytical methods and have the capacity to

complete the work on schedule. As such, the Pre-RD AOC Group has selected the following laboratories to perform the physical and chemical analyses:

- ALS in Kelso, Washington, will analyze for chlorinated pesticides, PAHs, bis-(2-ethylhexyl) phthalate, tributyltin, and total solids.
- TestAmerica in:
  - Fife, Washington, will analyze for total petroleum hydrocarbons diesel range, metals, TOC, grain size, and total solids.
  - Sacramento, California, will analyze for dioxins/furans.
  - Knoxville, Tennessee, will analyze for PCB congeners.

The analytes and analytical methods are provided in Table 7 for each sample type. Additional details on the analytical methods, QA/QC requirements and procedures, and laboratory-specific QA/QC requirements are detailed in Sections 4.5 and 4.6 of the QAPP (AECOM and Geosyntec 2018a). All samples will be placed in laboratory-supplied sample containers and preserved according to analytical protocols. Sample containers, preservation requirements, holding times, and sample sizes are provided for all analyses in Table 8.

## **6. DATA MANAGEMENT AND REPORTING**

### **6.1 Field Data Management**

The procedures and activities outlined in this FSP are designed to ensure DQOs outlined in the PDI Work Plan are met. Specifically, and as detailed in Sections 4.2, 4.3, 4.6, and 4.10 in the QAPP (AECOM and Geosyntec 2018a), the following data management procedures will be performed in the field:

- All samples will be given a unique identifier (Section 2.2 of this FSP).
- All samples will be collected and transported under chain-of-custody control (Section 4.5 of this FSP).
- Field logbooks and data sheets will be maintained (Section 4.6 of this FSP).
- Field QA/QC samples will be collected according to the QAPP (Section 4.9 of this FSP).

### **6.2 Post-Analysis Data Management and Reporting**

Analytical laboratories will be required to adhere to all QA/QC procedures outlined in the QAPP. Laboratories will provide all data for field investigations in electronic format and QA/QC reports, including a narrative of the standard QA/QC protocols. Data validation and data management will be performed according to the QAPP and DQMP. Following data validation,

all data, supplementary information, and validator qualifiers will be compiled into an SQL Server database for the project. Data summary files will be provided to EPA as they become available after data validation and database management.

Results from the implementation of this FSP will be used to support the data use objectives described in Section 1.3 of the PDI Work Plan (Geosyntec 2017: Table 5). Data summaries and evaluations will be included in the PDI Evaluation Report.

## 7. REFERENCES

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- EPA (United States Environmental Protection Agency). 2014. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), Third Edition, Update V.
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## **TABLES**

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**Table 1. Summary of Surface Sediment Sample Types, Numbers, and Analytes**

Surface Sediment Sample Type	Number of Samples	Analyses
Stratified Random Site Samples	428	All ROD Table 17 Analytes
SMA Site Samples	178	Focused COCs
Co-located Grabs at In-water Core Stations	60	Focused COCs
Downtown Reach	30	All ROD Table 17 Analytes
Upriver Reach	30	All ROD Table 17 Analytes
<b>Total Count</b>	<b>726</b>	

**Notes:**

All samples will be 0 to 30 centimeter depth.

All samples will be 3-point composites over a small footprint (< 25 feet).

Site = Portland Harbor Superfund Site RM 1.9 to 11.8

Downtown Reach = RM 11.8 to 16.6

Upriver Reach = RM 16.6 to 28.4

**Acronyms:**

COCs = contaminants of concern; RM = river mile; ROD = record of decision; SMA = sediment management area

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B001-BL1	-7.8	7612801	720887	001
	PDI-SG-B002-BL1	-32.6	7613979	720275	002
	PDI-SG-B003-BL1	-7.9	7614776	719726	003
	PDI-SG-B004-BL1	-10.9	7619956	717203	004
	PDI-SG-B005-BL1	-38.0	7618030	717200	005
	PDI-SG-B006-BL1	-34.8	7620153	714455	006
	PDI-SG-B007-BL1	-22.0	7619525	714384	007
	PDI-SG-B008-BL1	-40.1	7619969	713213	008
	PDI-SG-B009-BL1	-38.3	7616865	725994	009
	PDI-SG-B010-BL1	-49.0	7616429	724771	010
	PDI-SG-B011-BL1	-42.6	7615714	723434	011
	PDI-SG-B012-BL1	-42.9	7615836	723147	012
	PDI-SG-B013-BL1	-45.0	7615969	721331	013
	PDI-SG-B014-BL1	-44.0	7616117	720585	014
	PDI-SG-B015-BL1	-45.5	7616134	719342	015
	PDI-SG-B016-BL1	-43.7	7616398	718313	016
	PDI-SG-B017-BL1	-46.1	7616565	718055	017
	PDI-SG-B018-BL1	-45.1	7616746	716853	018
	PDI-SG-B019-BL1	-40.9	7617312	715070	019
	PDI-SG-B020-BL1	-43.4	7617600	715093	020
	PDI-SG-B021-BL1	-51.4	7618289	713159	021
	PDI-SG-B022-BL1	-59.7	7618634	712845	022
	PDI-SG-B023-BL1	-47.0	7618979	711926	023
	PDI-SG-B024-BL1	-40.5	7619758	710194	024
	PDI-SG-B025-BL1	-45.2	7620050	709917	025
	PDI-SG-B026-BL1	-46.2	7620660	709266	026
	PDI-SG-B027-BL1	-34.3	7621554	707828	027
	PDI-SG-B028-BL1	-45.8	7622578	707128	028
	PDI-SG-B029-BL1	-57.1	7623277	706482	029
	PDI-SG-B030-BL1	-44.7	7623768	705962	030
	PDI-SG-B031-BL1	-38.0	7624407	705530	031
	PDI-SG-B032-BL1	-41.4	7625369	704990	032
	PDI-SG-B033-BL1	-45.2	7626570	704436	033
	PDI-SG-B034-BL1	-39.7	7627079	703734	034
	PDI-SG-B035-BL1	-35.8	7628152	702596	035
	PDI-SG-B036-BL1	-42.5	7628726	702265	036
	PDI-SG-B037-BL1	-41.1	7629189	701648	037
	PDI-SG-B038-BL1	-52.8	7630100	701206	038
	PDI-SG-B039-BL1	-40.4	7630574	700344	039
	PDI-SG-B040-BL1	-31.5	7631463	699206	040
	PDI-SG-B041-BL1	-25.0	7632337	698186	041
	PDI-SG-B042-BL1	-34.0	7633442	697663	042
	PDI-SG-B043-BL1	-29.5	7633846	697210	043
	PDI-SG-B044-BL1	-32.4	7634433	696984	044
	PDI-SG-B045-BL1	-42.0	7636084	696134	045
	PDI-SG-B046-BL1	-36.4	7636814	695564	046
	PDI-SG-B047-BL1	-41.2	7637422	695253	047
	PDI-SG-B048-BL1	-37.8	7638388	694508	048
	PDI-SG-B049-BL1	-40.5	7639033	693807	049
	PDI-SG-B050-BL1	-41.3	7639356	693362	050
	PDI-SG-B051-BL1	-49.7	7640270	692769	051
	PDI-SG-B052-BL1	-52.0	7641333	691382	052
	PDI-SG-B053-BL1	-55.8	7641949	690485	053
	PDI-SG-B054-BL1	-34.0	7642543	689635	054
	PDI-SG-B055-BL1	-29.8	7643266	688913	055
	PDI-SG-B056-BL1	-32.6	7644268	687874	056
	PDI-SG-B057-BL1	-38.1	7644567	687621	057
	PDI-SG-B058-BL1	-41.2	7644909	687601	058

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B059-BL1	-49.0	7616987	725480	059
	PDI-SG-B060-BL1	-43.9	7616457	724443	060
	PDI-SG-B061-BL1	-35.7	7616505	723723	061
	PDI-SG-B062-BL1	-46.2	7616151	723279	062
	PDI-SG-B063-BL1	-43.6	7616122	721593	063
	PDI-SG-B064-BL1	-43.1	7616200	720559	064
	PDI-SG-B065-BL1	-47.2	7616388	719570	065
	PDI-SG-B066-BL1	-43.4	7616694	718944	066
	PDI-SG-B067-BL1	-44.4	7617290	717850	067
	PDI-SG-B068-BL1	-44.4	7617364	716252	068
	PDI-SG-B069-BL1	-51.7	7617651	716168	069
	PDI-SG-B070-BL1	-59.1	7618290	715307	070
	PDI-SG-B071-BL1	-70.9	7618632	713521	071
	PDI-SG-B072-BL1	-66.4	7619241	712696	072
	PDI-SG-B073-BL1	-65.8	7619575	712072	073
	PDI-SG-B074-BL1	-77.4	7619946	711038	074
	PDI-SG-B075-BL1	-53.1	7620965	709796	075
	PDI-SG-B076-BL1	-54.7	7621237	709164	076
	PDI-SG-B077-BL1	-45.7	7621918	708531	077
	PDI-SG-B078-BL1	-43.7	7622420	708161	078
	PDI-SG-B079-BL1	-53.0	7623400	706796	079
	PDI-SG-B080-BL1	-48.8	7624178	706187	080
	PDI-SG-B081-BL1	-51.4	7624609	705861	081
	PDI-SG-B082-BL1	-42.6	7625455	705395	082
	PDI-SG-B083-BL1	-44.7	7626480	704945	083
	PDI-SG-B084-BL1	-43.8	7627321	704274	084
	PDI-SG-B085-BL1	-46.4	7628122	703075	085
	PDI-SG-B086-BL1	-49.3	7628994	702411	086
	PDI-SG-B087-BL1	-44.0	7629711	702151	087
	PDI-SG-B088-BL1	-36.2	7631400	701516	088
	PDI-SG-B089-BL1	-44.0	7631135	699980	089
	PDI-SG-B090-BL1	-48.7	7632207	699406	090
	PDI-SG-B091-BL1	-45.4	7632542	698917	091
	PDI-SG-B092-BL1	-38.7	7633089	698217	092
	PDI-SG-B093-BL1	-37.5	7633711	697721	093
	PDI-SG-B094-BL1	-45.1	7634995	697138	094
	PDI-SG-B095-BL1	-45.3	7635739	696577	095
	PDI-SG-B096-BL1	-74.0	7637158	695822	096
	PDI-SG-B097-BL1	-39.9	7638287	695470	097
	PDI-SG-B098-BL1	-51.2	7638527	695195	098
	PDI-SG-B099-BL1	-35.6	7639298	694908	099
	PDI-SG-B100-BL1	-40.6	7640157	693685	100
	PDI-SG-B101-BL1	-50.2	7640836	692188	101
	PDI-SG-B102-BL1	-37.8	7641487	691912	102
	PDI-SG-B103-BL1	-43.4	7642465	690598	103
	PDI-SG-B104-BL1	-49.8	7642656	690280	104
	PDI-SG-B105-BL1	-45.2	7643535	689456	105
	PDI-SG-B106-BL1	-48.4	7644402	688802	106
	PDI-SG-B107-BL1	-32.7	7645019	688145	107
	PDI-SG-B108-BL1	-40.1	7644993	687639	108
	PDI-SG-B109-BL1	NA	7616223	726382	109
	PDI-SG-B110-BL1	-14.5	7616168	725962	110
	PDI-SG-B111-BL1	-9.0	7616026	725856	111
	PDI-SG-B112-BL1	-12.1	7615787	725287	112
	PDI-SG-B113-BL1	-18.5	7615838	725048	113
	PDI-SG-B114-BL1	NA	7615435	724765	114
	PDI-SG-B115-BL1	-13.9	7615557	724533	115
	PDI-SG-B116-BL1	-33.2	7615583	723961	116

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B117-BL1	-34.4	7615581	723415	117
	PDI-SG-B118-BL1	NA	7615152	723123	118
	PDI-SG-B119-BL1	-3.9	7615256	722977	119
	PDI-SG-B120-BL1	-9.3	7615254	722326	120
	PDI-SG-B121-BL1	NA	7615163	721939	121
	PDI-SG-B122-BL1	-54.7	7615532	721775	122
	PDI-SG-B123-BL1	-8.5	7615132	721046	123
	PDI-SG-B124-BL1	NA	7614939	720797	124
	PDI-SG-B125-BL1	NA	7615002	720453	125
	PDI-SG-B126-BL1	-16.6	7615017	719963	126
	PDI-SG-B127-BL1	-11.1	7615032	719597	127
	PDI-SG-B128-BL1	-16.9	7615493	719528	128
	PDI-SG-B129-BL1	NA	7615139	719198	129
	PDI-SG-B130-BL1	-25.6	7615665	718978	130
	PDI-SG-B131-BL1	-34.6	7615895	718389	131
	PDI-SG-B132-BL1	-30.9	7615779	718210	132
	PDI-SG-B133-BL1	-36.6	7616117	717965	133
	PDI-SG-B134-BL1	-36.4	7616265	717583	134
	PDI-SG-B135-BL1	-33.4	7616310	717241	135
	PDI-SG-B136-BL1	-34.8	7616547	716760	136
	PDI-SG-B137-BL1	-30.7	7616513	716599	137
	PDI-SG-B138-BL1	-26.6	7616599	716189	138
	PDI-SG-B139-BL1	-17.7	7616828	715518	139
	PDI-SG-B140-BL1	NA	7616826	715201	140
	PDI-SG-B141-BL1	-21.5	7616981	715113	141
	PDI-SG-B142-BL1	NA	7617115	714676	142
	PDI-SG-B143-BL1	NA	7617185	714478	143
	PDI-SG-B144-BL1	NA	7617357	713841	144
	PDI-SG-B145-BL1	NA	7617560	713699	145
	PDI-SG-B146-BL1	-24.2	7617800	713484	146
	PDI-SG-B147-BL1	NA	7617843	713024	147
	PDI-SG-B148-BL1	-8.6	7618138	712695	148
	PDI-SG-B149-BL1	NA	7618159	712484	149
	PDI-SG-B150-BL1	-6.8	7618367	712152	150
	PDI-SG-B151-BL1	NA	7618475	711792	151
	PDI-SG-B152-BL1	-31.9	7618818	711480	152
	PDI-SG-B153-BL1	-13.8	7618964	711098	153
	PDI-SG-B154-BL1	-19.5	7619124	710850	154
	PDI-SG-B155-BL1	-35.8	7619335	710638	155
	PDI-SG-B156-BL1	NA	7619508	710115	156
	PDI-SG-B157-BL1	NA	7619635	709986	157
	PDI-SG-B158-BL1	-19.6	7619912	709809	158
	PDI-SG-B159-BL1	-8.4	7620205	709319	159
	PDI-SG-B160-BL1	-31.9	7620494	709050	160
	PDI-SG-B161-BL1	-32.9	7620583	708939	161
	PDI-SG-B162-BL1	-22.5	7620874	708595	162
	PDI-SG-B163-BL1	-17.4	7621085	708293	163
	PDI-SG-B164-BL1	NA	7621324	707900	164
	PDI-SG-B165-BL1	-25.9	7621686	707653	165
	PDI-SG-B166-BL1	NA	7621756	707507	166
	PDI-SG-B167-BL1	NA	7622000	707091	167
	PDI-SG-B168-BL1	-13.0	7622217	706965	168
	PDI-SG-B169-BL1	-16.9	7622551	706680	169
	PDI-SG-B170-BL1	-5.0	7622702	706401	170
	PDI-SG-B171-BL1	-10.1	7622912	706126	171
	PDI-SG-B172-BL1	-38.3	7623543	706020	172
	PDI-SG-B173-BL1	NA	7623610	705858	173
	PDI-SG-B174-BL1	NA	7623843	705709	174

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
Stratified Random Site Samples	PDI-SG-B175-BL1	NA	7624283	705458	175
	PDI-SG-B176-BL1	NA	7624492	705341	176
	PDI-SG-B177-BL1	NA	7625008	704995	177
	PDI-SG-B178-BL1	NA	7625099	704992	178
	PDI-SG-B179-BL1	-33.0	7625624	704770	179
	PDI-SG-B180-BL1	-16.4	7625705	704679	180
	PDI-SG-B181-BL1	-28.9	7626061	704510	181
	PDI-SG-B182-BL1	-34.6	7626347	704356	182
	PDI-SG-B183-BL1	NA	7626403	703870	183
	PDI-SG-B184-BL1	NA	7626510	703675	184
	PDI-SG-B185-BL1	NA	7626878	703454	185
	PDI-SG-B186-BL1	NA	7627106	703159	186
	PDI-SG-B187-BL1	-16.6	7627563	702927	187
	PDI-SG-B188-BL1	NA	7627584	702769	188
	PDI-SG-B189-BL1	NA	7628032	702321	189
	PDI-SG-B190-BL1	-13.4	7628174	702214	190
	PDI-SG-B191-BL1	-25.5	7628536	701853	191
	PDI-SG-B192-BL1	NA	7628614	701604	192
	PDI-SG-B193-BL1	-19.7	7628694	701204	193
	PDI-SG-B194-BL1	-26.9	7628589	700934	194
	PDI-SG-B195-BL1	-35.7	7628723	700679	195
	PDI-SG-B196-BL1	-20.3	7629090	700309	196
	PDI-SG-B197-BL1	-8.8	7629632	700257	197
	PDI-SG-B198-BL1	-10.9	7629848	700119	198
	PDI-SG-B199-BL1	NA	7630148	699860	199
	PDI-SG-B200-BL1	NA	7630330	699532	200
	PDI-SG-B201-BL1	-11.9	7630632	699464	201
	PDI-SG-B202-BL1	-16.1	7630768	699211	202
	PDI-SG-B203-BL1	-9.5	7631196	698783	203
	PDI-SG-B204-BL1	-11.1	7631292	698677	204
	PDI-SG-B205-BL1	-12.2	7631501	698100	205
	PDI-SG-B206-BL1	-13.5	7631722	697935	206
	PDI-SG-B207-BL1	NA	7631774	697610	207
	PDI-SG-B208-BL1	-6.6	7632185	697491	208
	PDI-SG-B209-BL1	NA	7632621	697143	209
	PDI-SG-B210-BL1	-14.3	7632907	697095	210
	PDI-SG-B211-BL1	NA	7633314	696787	211
	PDI-SG-B212-BL1	-28.0	7633527	696813	212
	PDI-SG-B213-BL1	NA	7633798	696564	213
	PDI-SG-B214-BL1	-10.6	7634355	696256	214
	PDI-SG-B215-BL1	-14.9	7634402	696241	215
	PDI-SG-B216-BL1	-25.1	7634928	695974	216
	PDI-SG-B217-BL1	-21.9	7635041	695874	217
	PDI-SG-B218-BL1	-16.0	7635543	695787	218
	PDI-SG-B219-BL1	-16.8	7635680	695666	219
	PDI-SG-B220-BL1	-20.1	7635992	695430	220
	PDI-SG-B221-BL1	-21.8	7636483	695369	221
	PDI-SG-B222-BL1	NA	7636670	694831	222
	PDI-SG-B223-BL1	NA	7636891	694755	223
	PDI-SG-B224-BL1	-3.6	7637295	694326	224
	PDI-SG-B225-BL1	-32.5	7638030	694371	225
	PDI-SG-B226-BL1	-30.4	7638152	694220	226
	PDI-SG-B227-BL1	-13.8	7637443	694285	227
	PDI-SG-B228-BL1	-36.3	7638526	693899	228
	PDI-SG-B229-BL1	-37.2	7638615	693813	229
	PDI-SG-B230-BL1	-37.9	7639013	693466	230
	PDI-SG-B231-BL1	-38.5	7639218	693267	231
	PDI-SG-B232-BL1	-38.7	7639255	693228	232

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B233-BL1	-24.6	7639602	692854	233
	PDI-SG-B234-BL1	-22.1	7639731	692681	234
	PDI-SG-B235-BL1	-27.5	7640048	692298	235
	PDI-SG-B236-BL1	-29.3	7640165	692146	236
	PDI-SG-B237-BL1	-22.1	7640433	691791	237
	PDI-SG-B238-BL1	-25.3	7640657	691549	238
	PDI-SG-B239-BL1	-27.9	7640953	691149	239
	PDI-SG-B240-BL1	NA	7640838	690487	240
	PDI-SG-B241-BL1	NA	7641283	690634	241
	PDI-SG-B242-BL1	-11.5	7641555	690395	242
	PDI-SG-B243-BL1	NA	7641767	690106	243
	PDI-SG-B244-BL1	-9.8	7642022	689886	244
	PDI-SG-B245-BL1	-17.6	7642418	689508	245
	PDI-SG-B246-BL1	-16.2	7642652	689308	246
	PDI-SG-B247-BL1	-9.2	7642904	689061	247
	PDI-SG-B248-BL1	NA	7643133	688763	248
	PDI-SG-B249-BL1	NA	7643183	688734	249
	PDI-SG-B250-BL1	NA	7643497	688411	250
	PDI-SG-B251-BL1	-11.2	7643740	688216	251
	PDI-SG-B252-BL1	NA	7644006	687988	252
	PDI-SG-B253-BL1	NA	7644285	687670	253
	PDI-SG-B254-BL1	-37.0	7644534	687614	254
	PDI-SG-B255-BL1	-49.2	7644975	687415	255
	PDI-SG-B256-BL1	-50.4	7645151	687009	256
	PDI-SG-B257-BL1	-26.8	7645237	686724	257
	PDI-SG-B258-BL1	-68.1	7645737	686591	258
	PDI-SG-B259-BL1	-41.6	7617552	725384	259
	PDI-SG-B260-BL1	-45.2	7617360	725438	260
	PDI-SG-B261-BL1	-45.1	7617274	725225	261
	PDI-SG-B262-BL1	-45.6	7617115	724852	262
	PDI-SG-B263-BL1	-30.3	7617513	724549	263
	PDI-SG-B264-BL1	-36.5	7617117	724302	264
	PDI-SG-B265-BL1	-36.9	7617158	724020	265
	PDI-SG-B266-BL1	-34.2	7616599	723675	266
	PDI-SG-B267-BL1	-33.0	7616931	723304	267
	PDI-SG-B268-BL1	-22.0	7616982	722941	268
	PDI-SG-B269-BL1	-34.2	7616857	722699	269
	PDI-SG-B270-BL1	-31.7	7616836	722509	270
	PDI-SG-B271-BL1	-40.8	7616472	721953	271
	PDI-SG-B272-BL1	-44.9	7616323	721720	272
	PDI-SG-B273-BL1	-41.3	7616506	721652	273
	PDI-SG-B274-BL1	NA	7616859	721056	274
	PDI-SG-B275-BL1	-38.0	7616561	720789	275
	PDI-SG-B276-BL1	-41.9	7616580	720489	276
	PDI-SG-B277-BL1	-41.3	7616668	720238	277
	PDI-SG-B278-BL1	NA	7616932	719955	278
	PDI-SG-B279-BL1	-32.9	7616937	719319	279
	PDI-SG-B280-BL1	-6.1	7617080	719063	280
	PDI-SG-B281-BL1	-39.9	7616930	718861	281
	PDI-SG-B282-BL1	-22.5	7617278	718377	282
	PDI-SG-B283-BL1	-42.1	7617183	718225	283
	PDI-SG-B284-BL1	-51.9	7617416	717666	284
	PDI-SG-B285-BL1	-45.7	7617627	717363	285
	PDI-SG-B286-BL1	-49.7	7617698	717198	286
	PDI-SG-B287-BL1	-31.6	7617869	716776	287
	PDI-SG-B288-BL1	NA	7618120	716555	288
	PDI-SG-B289-BL1	-26.6	7618103	716297	289
	PDI-SG-B290-BL1	-34.8	7618148	716034	290

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B291-BL1	-16.6	7618474	715577	291
	PDI-SG-B292-BL1	NA	7618610	715242	292
	PDI-SG-B293-BL1	-26.6	7618646	715118	293
	PDI-SG-B294-BL1	-34.8	7618892	714586	294
	PDI-SG-B295-BL1	-18.0	7619021	714287	295
	PDI-SG-B296-BL1	-24.4	7619107	714002	296
	PDI-SG-B297-BL1	-13.1	7619349	713804	297
	PDI-SG-B298-BL1	-46.7	7619531	713352	298
	PDI-SG-B299-BL1	-38.2	7619707	713147	299
	PDI-SG-B300-BL1	-14.0	7619712	712826	300
	PDI-SG-B301-BL1	-30.6	7619809	712521	301
	PDI-SG-B302-BL1	-39.8	7619944	712113	302
	PDI-SG-B303-BL1	-40.3	7620085	711863	303
	PDI-SG-B304-BL1	-22.6	7620378	711474	304
	PDI-SG-B305-BL1	-27.5	7620401	711377	305
	PDI-SG-B306-BL1	-31.6	7620573	710980	306
	PDI-SG-B307-BL1	NA	7620817	710617	307
	PDI-SG-B308-BL1	-12.1	7621028	710377	308
	PDI-SG-B309-BL1	-31.1	7621075	710135	309
	PDI-SG-B310-BL1	-22.5	7621328	709783	310
	PDI-SG-B311-BL1	NA	7621459	709649	311
	PDI-SG-B312-BL1	-16.8	7621572	709342	312
	PDI-SG-B313-BL1	-32.5	7621846	708885	313
	PDI-SG-B314-BL1	-16.0	7622091	708750	314
	PDI-SG-B315-BL1	NA	7622233	708556	315
	PDI-SG-B316-BL1	-37.8	7622493	708153	316
	PDI-SG-B317-BL1	-52.8	7622683	707805	317
	PDI-SG-B318-BL1	-10.8	7623016	707770	318
	PDI-SG-B319-BL1	-46.9	7623053	707443	319
	PDI-SG-B320-BL1	-47.3	7623258	707067	320
	PDI-SG-B321-BL1	-47.6	7623548	706865	321
	PDI-SG-B322-BL1	-51.5	7623623	706712	322
	PDI-SG-B323-BL1	-42.8	7624151	706660	323
	PDI-SG-B324-BL1	-25.3	7624403	706537	324
	PDI-SG-B325-BL1	-19.2	7624738	706488	325
	PDI-SG-B326-BL1	-43.1	7624954	706047	326
	PDI-SG-B327-BL1	-43.7	7625178	705894	327
	PDI-SG-B328-BL1	-49.6	7625602	705583	328
	PDI-SG-B329-BL1	-50.4	7626034	705608	329
	PDI-SG-B330-BL1	-25.3	7626544	705786	330
	PDI-SG-B331-BL1	-28.0	7626718	705358	331
	PDI-SG-B332-BL1	-22.1	7626955	705370	332
	PDI-SG-B333-BL1	-20.7	7627365	704793	333
	PDI-SG-B334-BL1	-47.4	7627454	704204	334
	PDI-SG-B335-BL1	NA	7628162	704529	335
	PDI-SG-B336-BL1	-25.7	7628014	704229	336
	PDI-SG-B337-BL1	NA	7628505	704240	337
	PDI-SG-B338-BL1	-60.2	7628432	703284	338
	PDI-SG-B339-BL1	-57.1	7628824	703173	339
	PDI-SG-B340-BL1	-9.2	7629476	703298	340
	PDI-SG-B341-BL1	-54.5	7629186	702585	341
	PDI-SG-B342-BL1	-51.6	7629323	702392	342
	PDI-SG-B343-BL1	-18.0	7630137	702514	343
	PDI-SG-B344-BL1	-16.3	7630464	702247	344
	PDI-SG-B345-BL1	-10.4	7630610	702121	345
	PDI-SG-B346-BL1	-19.8	7631008	701861	346
	PDI-SG-B347-BL1	NA	7631240	701810	347
	PDI-SG-B348-BL1	-20.3	7631597	701592	348

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B349-BL1	NA	7631939	701629	349
	PDI-SG-B350-BL1	-29.6	7632256	701598	350
	PDI-SG-B351-BL1	-42.8	7631704	700269	351
	PDI-SG-B352-BL1	NA	7631938	700224	352
	PDI-SG-B353-BL1	-33.5	7632235	699964	353
	PDI-SG-B354-BL1	-37.5	7632535	699645	354
	PDI-SG-B355-BL1	-36.1	7632665	699558	355
	PDI-SG-B356-BL1	-40.4	7632981	699260	356
	PDI-SG-B357-BL1	-38.0	7633219	699056	357
	PDI-SG-B358-BL1	-41.9	7633352	698900	358
	PDI-SG-B359-BL1	-38.0	7633722	698591	359
	PDI-SG-B360-BL1	NA	7634072	698575	360
	PDI-SG-B361-BL1	-13.1	7634411	698221	361
	PDI-SG-B362-BL1	NA	7634572	698170	362
	PDI-SG-B363-BL1	-33.1	7634678	697884	363
	PDI-SG-B364-BL1	NA	7635056	697778	364
	PDI-SG-B365-BL1	-33.6	7635199	697487	365
	PDI-SG-B366-BL1	NA	7635609	697319	366
	PDI-SG-B367-BL1	-25.1	7635989	696999	367
	PDI-SG-B368-BL1	-22.5	7636122	696932	368
	PDI-SG-B369-BL1	-25.4	7636625	696614	369
	PDI-SG-B370-BL1	-14.1	7636724	696564	370
	PDI-SG-B371-BL1	-32.3	7637014	696259	371
	PDI-SG-B372-BL1	-24.1	7637380	696139	372
	PDI-SG-B373-BL1	-13.7	7637827	695913	373
	PDI-SG-B374-BL1	-34.6	7637847	695786	374
	PDI-SG-B375-BL1	NA	7638211	695705	375
	PDI-SG-B376-BL1	NA	7638545	695546	376
	PDI-SG-B377-BL1	-30.2	7638665	695328	377
	PDI-SG-B378-BL1	-4.2	7639021	695279	378
	PDI-SG-B379-BL1	-18.3	7639611	694986	379
	PDI-SG-B380-BL1	-36.5	7639871	694437	380
	PDI-SG-B381-BL1	-21.5	7640151	694091	381
	PDI-SG-B382-BL1	-37.9	7640160	693929	382
	PDI-SG-B383-BL1	-34.6	7640370	693631	383
	PDI-SG-B384-BL1	-31.9	7640564	693260	384
	PDI-SG-B385-BL1	-33.9	7640672	693077	385
	PDI-SG-B386-BL1	-34.5	7640977	692683	386
	PDI-SG-B387-BL1	-9.9	7641258	692381	387
	PDI-SG-B388-BL1	-9.6	7641436	692177	388
	PDI-SG-B389-BL1	-29.2	7641571	691924	389
	PDI-SG-B390-BL1	-25.2	7641874	691570	390
	PDI-SG-B391-BL1	NA	7642057	691442	391
	PDI-SG-B392-BL1	-6.0	7642430	690949	392
	PDI-SG-B393-BL1	-14.0	7642539	690766	393
	PDI-SG-B394-BL1	-21.3	7642739	690508	394
	PDI-SG-B395-BL1	NA	7642895	690405	395
	PDI-SG-B396-BL1	-15.1	7643325	689968	396
	PDI-SG-B397-BL1	-24.2	7643596	689772	397
	PDI-SG-B398-BL1	-31.3	7643852	689582	398
	PDI-SG-B399-BL1	-41.8	7643915	689458	399
	PDI-SG-B400-BL1	-10.6	7644261	689277	400
	PDI-SG-B401-BL1	-49.2	7644499	688962	401
	PDI-SG-B402-BL1	-44.7	7644669	688722	402
	PDI-SG-B403-BL1	-24.1	7644917	688372	403
	PDI-SG-B404-BL1	-39.1	7645168	687847	404
	PDI-SG-B405-BL1	-41.7	7645169	687531	405
	PDI-SG-B406-BL1	-45.2	7645386	687495	406

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
Downtown/ Upriver Reach <sup>c</sup>	PDI-SG-B407-BL1	-36.8	7645725	687007	407
	PDI-SG-B408-BL1	-67.2	7645741	686809	408
	PDI-SG-B409-BL1	-6.9	7636897	698745	409
	PDI-SG-B410-BL1	-14.3	7636417	698725	410
	PDI-SG-B411-BL1	-21.1	7636178	699081	411
	PDI-SG-B412-BL1	-23.2	7635971	699580	412
	PDI-SG-B413-BL1	-20.3	7635524	699491	413
	PDI-SG-B414-BL1	-25.9	7635402	699676	414
	PDI-SG-B415-BL1	-23.5	7635412	700151	415
	PDI-SG-B416-BL1	-29.9	7634887	700392	416
	PDI-SG-B417-BL1	NA	7634868	700603	417
	PDI-SG-B418-BL1	-32.2	7634458	700657	418
	PDI-SG-B419-BL1	-23.7	7634346	700967	419
	PDI-SG-B420-BL1	-33.1	7633887	701103	420
	PDI-SG-B421-BL1	-34.0	7633484	701223	421
	PDI-SG-B422-BL1	-29.6	7633513	701483	422
	PDI-SG-B423-BL1	-27.9	7633388	701785	423
	PDI-SG-B424-BL1	-23.5	7632677	701777	424
	PDI-SG-B425-BL1	-49.6	7632675	701227	425
	PDI-SG-B426-BL1	-32.9	7632109	701132	426
	PDI-SG-B427-BL1	-32.8	7632116	700590	427
	PDI-SG-B428-BL1	-58.5	7632140	700244	428
	PDI-SG-B429	-42.1	7645962	669232	429
	PDI-SG-B430	-41.1	7646819	674433	430
	PDI-SG-B431	-73.4	7646059	686517	431
	PDI-SG-B432	NA	7648127	673240	432
	PDI-SG-B433	-43.7	7646620	677294	433
	PDI-SG-B434	-36.6	7646079	685513	434
	PDI-SG-B435	-25.7	7645449	670037	435
	PDI-SG-B436	NA	7647456	666819	436
	PDI-SG-B437	NA	7647373	670100	437
	PDI-SG-B438	-5.9	7646978	685750	438
	PDI-SG-B439	-23.4	7646473	662732	439
	PDI-SG-B440	NA	7649494	669536	440
	PDI-SG-B441	-17.2	7646243	673937	441
	PDI-SG-B442	-25.5	7646998	668786	442
	PDI-SG-B443	-23.9	7645980	679883	443
	PDI-SG-B444	NA	7647787	675182	444
	PDI-SG-B445	-29.1	7646377	664926	445
	PDI-SG-B446	-63.6	7646725	684475	446
	PDI-SG-B447	-7.5	7646388	681670	447
	PDI-SG-B448	NA	7645481	672284	448
	PDI-SG-B449	-24.2	7646509	679294	449
	PDI-SG-B450	-39.4	7646589	678769	450
	PDI-SG-B451	-35.9	7645990	678994	451
	PDI-SG-B452	NA	7645539	678743	452
	PDI-SG-B453	-19.6	7646095	677943	453
	PDI-SG-B454	NA	7648026	667764	454
	PDI-SG-B455	-9.6	7646061	665423	455
	PDI-SG-B456	-36.0	7646208	667785	456
	PDI-SG-B457	-48.9	7646659	666342	457
	PDI-SG-B458	NA	7648657	668012	458
	PDI-SG-B459	NA	7649116	648453	459
	PDI-SG-B460	NA	7648837	616091	460
	PDI-SG-B461	NA	7660848	625202	461
	PDI-SG-B462	NA	7651215	652867	462
	PDI-SG-B463	NA	7656520	620745	463
	PDI-SG-B464	NA	7655225	637366	464

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
PDI-SG	PDI-SG-B465	NA	7649957	616953	465
	PDI-SG-B466	NA	7653844	619000	466
	PDI-SG-B467	NA	7658613	629828	467
	PDI-SG-B468	NA	7650905	654818	468
	PDI-SG-B469	NA	7659340	628417	469
	PDI-SG-B470	NA	7651371	617889	470
	PDI-SG-B471	NA	7649075	656517	471
	PDI-SG-B472	NA	7657130	632145	472
	PDI-SG-B473	NA	7646575	661673	473
	PDI-SG-B474	NA	7648175	659064	474
	PDI-SG-B475	NA	7650556	641255	475
	PDI-SG-B476	NA	7655444	619931	476
	PDI-SG-B477	NA	7661789	626422	477
	PDI-SG-B478	NA	7661422	627563	478
	PDI-SG-B479	NA	7655665	634749	479
	PDI-SG-B480	NA	7660512	628728	480
	PDI-SG-B481	NA	7648443	657700	481
	PDI-SG-B482	NA	7656624	634178	482
	PDI-SG-B483	NA	7648574	645658	483
	PDI-SG-B484	NA	7657960	630086	484
	PDI-SG-B485	NA	7651921	618383	485
	PDI-SG-B486	NA	7651435	639490	486
	PDI-SG-B487	NA	7650227	653027	487
	PDI-SG-B488	NA	7650034	649837	488
PDI-SG	PDI-SG-S001	-19.4	7637602	696023	001
	PDI-SG-S002	-35.8	7632837	701597	002
	PDI-SG-S003	-27.1	7633185	701784	003
	PDI-SG-S004	-46.2	7621841	708208	004
	PDI-SG-S005	NA	7629051	703558	005
	PDI-SG-S006	-36.4	7623469	707231	006
	PDI-SG-S007	NA	7632704	700805	007
	PDI-SG-S008	-15.4	7636643	699218	008
	PDI-SG-S009	-28.4	7623244	706171	009
	PDI-SG-S010	-13.7	7636758	698960	010
	PDI-SG-S011	-11.0	7636654	698746	011
	PDI-SG-S012	NA	7636706	698453	012
	PDI-SG-S013	-18.8	7636304	698915	013
	PDI-SG-S014	-17.3	7636477	699071	014
	PDI-SG-S015	-20.1	7636405	699406	015
	PDI-SG-S016	-4.1	7635223	700364	016
	PDI-SG-S017	-25.5	7635617	699935	017
	PDI-SG-S018	-22.4	7635739	699425	018
	PDI-SG-S019	-23.8	7635704	699685	019
	PDI-SG-S020	-27.1	7635297	699937	020
	PDI-SG-S021	-35.7	7640001	694254	021
	PDI-SG-S022	-32.6	7635087	699825	022
	PDI-SG-S023	NA	7636937	699124	023
	PDI-SG-S024	-22.3	7636042	699322	024
	PDI-SG-S025	-31.8	7634586	700378	025
	PDI-SG-S026	-17.6	7634615	700796	026
	PDI-SG-S027	-11.8	7635931	699879	027
	PDI-SG-S028	-47.2	7620330	710026	028
	PDI-SG-S029	-33.0	7634779	700167	029
	PDI-SG-S030	NA	7631874	700471	030
	PDI-SG-S031	-43.9	7632004	699996	031
	PDI-SG-S032	-16.7	7635733	695498	032
	PDI-SG-S033	-30.0	7629439	700574	033
	PDI-SG-S034	-43.8	7629277	700786	034

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-S035	-11.1	7626327	704104	035
	PDI-SG-S036	-44.0	7624706	705476	036
	PDI-SG-S037	-44.5	7626449	705210	037
	PDI-SG-S038	-37.4	7626498	705490	038
	PDI-SG-S039	-47.6	7620058	710152	039
	PDI-SG-S040	-45.0	7623993	706160	040
	PDI-SG-S041	-4.5	7622856	708004	041
	PDI-SG-S042	-46.9	7620850	709046	042
	PDI-SG-S043	NA	7619578	713890	043
	PDI-SG-S044	-33.1	7619381	714641	044
	PDI-SG-S045	-8.8	7617774	724959	045
	PDI-SG-S046	NA	7617962	725157	046
	PDI-SG-S047	-33.3	7617585	724727	047
	PDI-SG-S048	-17.4	7617459	724368	048
	PDI-SG-S049	-30.9	7617311	724217	049
	PDI-SG-S050	-25.5	7617100	723514	050
	PDI-SG-S051	-3.7	7617105	723217	051
	PDI-SG-S052	NA	7616992	722624	052
	PDI-SG-S053	NA	7617004	722340	053
	PDI-SG-S054	-34.7	7616718	721796	054
	PDI-SG-S055	-30.7	7616779	721391	055
	PDI-SG-S056	-30.8	7619197	717135	056
	PDI-SG-S057	-38.5	7618724	717136	057
	PDI-SG-S058	-37.7	7618422	717115	058
	PDI-SG-S059	-38.9	7618228	717186	059
	PDI-SG-S060	NA	7617909	717009	060
	PDI-SG-S061	NA	7618253	716287	061
	PDI-SG-S062	NA	7618335	715997	062
	PDI-SG-S063	NA	7618408	715789	063
	PDI-SG-S064	NA	7618567	715423	064
	PDI-SG-S065	NA	7616630	715972	065
	PDI-SG-S066	NA	7616671	715749	066

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
SMA Targeted Samples and Co-Located Grab at Core Location	PDI-SG-S067	-13.1	7617451	714126	067
	PDI-SG-S068	-12.7	7617310	714319	068
	PDI-SG-S069	-32.5	7620324	714503	069
	PDI-SG-S070	-35.1	7619847	714517	070
	PDI-SG-S071	-26.2	7619590	714678	071
	PDI-SG-S072	-32.6	7619270	714452	072
	PDI-SG-S073	-43.0	7619277	713511	073
	PDI-SG-S074	-45.8	7619774	713421	074
	PDI-SG-S075	-48.1	7620077	713408	075
	PDI-SG-S076	-37.3	7620262	713165	076
	PDI-SG-S077	-45.9	7620409	713319	077
	PDI-SG-S078	NA	7618239	712310	078
	PDI-SG-S079	-55.1	7619937	710436	079
	PDI-SG-S080	-50.2	7620270	710342	080
	PDI-SG-S081	-47.3	7620604	709561	081
	PDI-SG-S082	-51.7	7620889	709461	082
	PDI-SG-S083	-51.5	7620959	709255	083
	PDI-SG-S084	NA	7620015	709541	084
	PDI-SG-S085	NA	7620318	709147	085
	PDI-SG-S086	-12.4	7620681	708690	086
	PDI-SG-S087	NA	7620966	708437	087
	PDI-SG-S088	-29.8	7621671	709095	088
	PDI-SG-S089	NA	7622526	708389	089
	PDI-SG-S090	-47.0	7621546	708370	090
	PDI-SG-S091	-47.4	7622061	708071	091
	PDI-SG-S092	-50.9	7622191	707840	092
	PDI-SG-S093	-50.7	7622058	707626	093
	PDI-SG-S094	-44.3	7622108	707245	094
	PDI-SG-S095	-44.5	7622449	706903	095
	PDI-SG-S096	NA	7623213	707638	096
	PDI-SG-S097	NA	7623366	707450	097
	PDI-SG-S098	-17.8	7623732	707137	098
	PDI-SG-S099	-33.7	7622807	706534	099
	PDI-SG-S100	-13.3	7622987	706298	100
	PDI-SG-S101	-48.9	7623633	706523	101
	PDI-SG-S102	-7.8	7624552	706646	102
	PDI-SG-S103	-6.4	7624971	706403	103
	PDI-SG-S104	-36.1	7624857	705236	104
	PDI-SG-S105	NA	7625423	706206	105
	PDI-SG-S106	NA	7625707	706104	106
	PDI-SG-S107	NA	7625993	706004	107
	PDI-SG-S108	NA	7626287	705943	108
	PDI-SG-S109	-19.7	7626998	705809	109
	PDI-SG-S110	-12.5	7627283	705707	110
	PDI-SG-S111	-10.6	7627197	705454	111
	PDI-SG-S112	-44.5	7626776	704896	112
	PDI-SG-S113	-46.2	7625575	705190	113
	PDI-SG-S114	-47.2	7625815	704973	114
	PDI-SG-S115	NA	7626673	703543	115
	PDI-SG-S116	-30.7	7626783	703799	116
	PDI-SG-S117	NA	7627256	702997	117
	PDI-SG-S118	NA	7628385	704100	118
	PDI-SG-S119	-4.4	7628619	703925	119
	PDI-SG-S120	NA	7628828	703729	120
	PDI-SG-S121	-5.5	7629314	703467	121
	PDI-SG-S122	-19.5	7628346	702019	122

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-S123	NA	7628438	701361	123
	PDI-SG-S124	-34.7	7628840	700428	124
	PDI-SG-S125	-37.5	7629029	701024	125
	PDI-SG-S126	-35.7	7629045	700755	126
	PDI-SG-S127	NA	7630027	699987	127
	PDI-SG-S128	-22.3	7630320	699720	128
	PDI-SG-S129	NA	7630506	699311	129
	PDI-SG-S130	NA	7630934	698949	130
	PDI-SG-S131	NA	7631252	698149	131
	PDI-SG-S132	-19.1	7631432	698399	132
	PDI-SG-S133	-25.3	7631721	698305	133
	PDI-SG-S134	-25.0	7631941	698098	134
	PDI-SG-S135	-11.9	7632159	697892	135
	PDI-SG-S136	-15.8	7632379	697684	136
	PDI-SG-S137	NA	7631956	697409	137
	PDI-SG-S138	NA	7632397	697248	138
	PDI-SG-S139	-15.9	7632574	697493	139
	PDI-SG-S140	-18.3	7632756	697314	140
	PDI-SG-S141	-27.8	7633143	697043	141
	PDI-SG-S142	-16.2	7634098	696454	142
	PDI-SG-S143	-17.3	7635278	695746	143
	PDI-SG-S144	-19.5	7636119	695232	144
	PDI-SG-S145	-18.3	7636390	695093	145
	PDI-SG-S146	-19.8	7636627	695075	146
	PDI-SG-S147	-14.2	7637107	694683	147
	PDI-SG-S148	-20.3	7639895	692464	148
	PDI-SG-S149	NA	7631607	700516	149
	PDI-SG-S150	-57.2	7631788	700712	150
	PDI-SG-S151	-38.2	7632034	700860	151
	PDI-SG-S152	-6.6	7632396	700483	152
	PDI-SG-S153	-41.5	7632407	700714	153
	PDI-SG-S154	-33.7	7632356	701007	154
	PDI-SG-S155	-35.7	7632329	701316	155
	PDI-SG-S156	-32.8	7632550	701508	156
	PDI-SG-S157	NA	7633179	701189	157
	PDI-SG-S158	-34.8	7633170	701487	158
	PDI-SG-S159	-24.4	7633614	701703	159
	PDI-SG-S160	-26.3	7633802	701391	160
	PDI-SG-S161	-33.4	7633678	701116	161
	PDI-SG-S162	-13.8	7634144	701259	162
	PDI-SG-S163	-41.3	7632961	700962	163
	PDI-SG-S164	-30.6	7634163	700983	164
	PDI-SG-S165	-32.3	7633972	700775	165
	PDI-SG-S166	-19.7	7635786	697155	166
	PDI-SG-S167	-28.7	7639814	694669	167
	PDI-SG-S168	-2.6	7641772	691789	168
	PDI-SG-S169	-22.7	7634664	696105	169
	PDI-SG-S170	-8.2	7615798	717953	170
	PDI-SG-S171	NA	7625201	706313	171
	PDI-SG-S172	-31.1	7627417	703217	172
	PDI-SG-S173	-32.4	7627852	702736	173
	PDI-SG-S174		-- <sup>d</sup>		174
	PDI-SG-S175		-- <sup>d</sup>		175
	PDI-SG-S176		-- <sup>d</sup>		176
	PDI-SG-S177		-- <sup>d</sup>		177
	PDI-SG-S178		-- <sup>d</sup>		178
	PDI-SG-S179	-33.2	7633962	701062	179

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-S180	-34.4	7632913	701344	180
	PDI-SG-S181	-34.7	7634188	700562	181
	PDI-SG-S182	-43.3	7632595	701150	182
	PDI-SG-S183	-47.5	7632893	700639	183
	PDI-SG-S184	-28.8	7628124	702358	184
	PDI-SG-S185	-16.4	7627591	702895	185
	PDI-SG-S186	-7.4	7627058	703341	186
	PDI-SG-S187	-40.5	7624300	705633	187
	PDI-SG-S188	NA	7617773	724734	188
	PDI-SG-S189	-50.2	7617456	724628	189
	PDI-SG-S190	-23.9	7617252	723774	190
	PDI-SG-S191	NA	7617459	724094	191
	PDI-SG-S192	-26.8	7616724	721583	192
	PDI-SG-S193	NA	7617439	718244	193
	PDI-SG-S194	-24.5	7619022	717183	194
	PDI-SG-S195	-9.2	7619801	717237	195
	PDI-SG-S196	NA	7620017	717043	196
	PDI-SG-S197	-22.4	7619579	717143	197
	PDI-SG-S198	-14.6	7619376	717044	198
	PDI-SG-S199	NA	7622302	708577	199
	PDI-SG-S200	-36.9	7622381	708289	200
	PDI-SG-S201	NA	7622708	708150	201
	PDI-SG-S202	-45.6	7622717	706801	202
	PDI-SG-S203	-52.1	7623127	706477	203
	PDI-SG-S204	-44.6	7623821	706068	204
	PDI-SG-S205	-22.2	7628840	701456	205
	PDI-SG-S206	-23.7	7628742	701110	206
	PDI-SG-S207	NA	7633678	696608	207
	PDI-SG-S208	NA	7633085	696850	208
	PDI-SG-S209	-23.4	7637333	694599	209
	PDI-SG-S210	-16.8	7637494	694351	210
	PDI-SG-S211	NA	7637282	694037	211
	PDI-SG-S212	NA	7637134	694050	212
	PDI-SG-S213	-7.0	7627909	702473	213
	PDI-SG-S214	-50.8	7621839	707823	214
	PDI-SG-S215	-50.6	7621575	708068	215
	PDI-SG-S216	-13.4	7633418	696809	216
	PDI-SG-S217	-27.7	7626545	703974	217
	PDI-SG-S218	-13.1	7633011	701894	218
	PDI-SG-S219	-31.8	7634983	700092	219
	PDI-SG-S220	-23.0	7636127	699519	220
	PDI-SG-S221	-25.8	7629268	700351	221
	PDI-SG-S222	NA	7617321	723892	222
	PDI-SG-S223	-11.8	7617765	713413	223
	PDI-SG-S224	NA	7617671	713451	224
	PDI-SG-S225	-9.3	7619660	713672	225
	PDI-SG-S226	-12.4	7618175	712583	226
	PDI-SG-S227	-9.1	7618418	712123	227
	PDI-SG-S228	-10.1	7618651	711678	228
	PDI-SG-S229	-9.7	7619684	710015	229
	PDI-SG-S230	-10.8	7623957	706996	230
	PDI-SG-S231	-44.0	7626477	705121	231
	PDI-SG-S232	-31.6	7626895	705602	232
	PDI-SG-S233	NA	7635857	699176	233
	PDI-SG-S234	-28.8	7633359	696915	234
	PDI-SG-S235		-- <sup>d</sup>		235
	PDI-SG-S236		-- <sup>d</sup>		236

**Table 2. Station Location Coordinates, Target Depth, and Identification Scheme**

Sample Type	Sample ID	Mudline Elevation (CRD - Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-S237		-- <sup>d</sup>	-- <sup>d</sup>	237
	PDI-SG-S238		-- <sup>d</sup>	-- <sup>d</sup>	238

**Notes:**

All surface sediment samples have a target depth of 30 centimeters.

Conversion From CRD to NAVD88: Elevation (CRD) +5.38=NAVD88

NA = not available

**Footnotes:**

a) Vertical Datum: CRD (feet); based on 2009 NOAA bathymetry

b) Horizontal Projection: NAD 1983 Oregon State Plane North (Intl Feet)

c) Upriver surface sediment samples will target fine-grained materials following field recognition. These locations are draft and may be updated following these efforts.

d) Five SMA and four Core Locations samples pulled from River Mile 11E area will be redistributed and confirmed at a later date.

**Acronyms:**

CRD = Columbia River Datum; ID = identification number; NA = not available; NAD = North American Datum; NAVD88 = North American Vertical Datum of 1988; NOAA = National Oceanic and Atmospheric Administration; SMA = sediment management area

**Table 3. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 1 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B001-BL1	NA	7612929	720099	001
	PDI-SG-B002-BL1	-36.6	7613969	720178	002
	PDI-SG-B003-BL1	-51.3	7614466	720153	003
	PDI-SG-B004-BL1	-19.2	7619617	717192	004
	PDI-SG-B005-BL1	-38.3	7618173	717197	005
	PDI-SG-B006-BL1	-29.5	7620330	714535	006
	PDI-SG-B007-BL1	-5.9	7619242	714740	007
	PDI-SG-B008-BL1	NA	7619714	713066	008
	PDI-SG-B009-BL1	-46.4	7616834	725513	009
	PDI-SG-B010-BL1	-48.2	7616324	724498	010
	PDI-SG-B011-BL1	-45.1	7615893	723608	011
	PDI-SG-B012-BL1	-39.5	7615638	722897	012
	PDI-SG-B013-BL1	-50.1	7615763	721835	013
	PDI-SG-B014-BL1	-44.5	7616034	720422	014
	PDI-SG-B015-BL1	-42.8	7616134	719107	015
	PDI-SG-B016-BL1	-45.4	7616233	719099	016
	PDI-SG-B017-BL1	-47.6	7616789	717713	017
	PDI-SG-B018-BL1	-44.6	7616931	716481	018
	PDI-SG-B019-BL1	-49.5	7617647	715360	019
	PDI-SG-B020-BL1	-42.7	7617617	714647	020
	PDI-SG-B021-BL1	-58.1	7618291	713543	021
	PDI-SG-B022-BL1	-48.0	7618316	712888	022
	PDI-SG-B023-BL1	-47.8	7619042	711844	023
	PDI-SG-B024-BL1	-50.0	7619647	710794	024
	PDI-SG-B025-BL1	-47.8	7620057	710167	025
	PDI-SG-B026-BL1	-46.8	7620826	708953	026
	PDI-SG-B027-BL1	-35.6	7621531	707901	027
	PDI-SG-B028-BL1	-50.9	7622093	707770	028
	PDI-SG-B029-BL1	-44.0	7622824	706947	029
	PDI-SG-B030-BL1	-43.1	7623967	706092	030
	PDI-SG-B031-BL1	-45.9	7624625	705680	031
	PDI-SG-B032-BL1	-46.3	7625402	705067	032
	PDI-SG-B033-BL1	-40.5	7626717	704113	033
	PDI-SG-B034-BL1	-38.0	7626943	703820	034
	PDI-SG-B035-BL1	-38.6	7628137	702711	035
	PDI-SG-B036-BL1	-36.4	7628268	702468	036
	PDI-SG-B037-BL1	-47.1	7629501	701503	037
	PDI-SG-B038-BL1	-37.8	7630144	700524	038
	PDI-SG-B039-BL1	-25.7	7630748	699445	039
	PDI-SG-B040-BL1	-26.1	7631032	699281	040
	PDI-SG-B041-BL1	-24.1	7632021	698079	041
	PDI-SG-B042-BL1	-32.0	7633119	697397	042
	PDI-SG-B043-BL1	-27.9	7633710	696954	043
	PDI-SG-B044-BL1	-35.5	7634762	696879	044
	PDI-SG-B045-BL1	-12.2	7635587	695877	045
	PDI-SG-B046-BL1	-26.0	7636509	695510	046
	PDI-SG-B047-BL1	-40.9	7637901	694961	047
	PDI-SG-B048-BL1	-43.8	7638906	694424	048
	PDI-SG-B049-BL1	-40.7	7638987	694039	049
	PDI-SG-B050-BL1	-34.3	7639601	692933	050
	PDI-SG-B051-BL1	-47.9	7640452	692522	051
	PDI-SG-B052-BL1	-49.3	7641340	691107	052
	PDI-SG-B053-BL1	-55.6	7641722	690886	053
	PDI-SG-B054-BL1	-41.6	7642872	689479	054
	PDI-SG-B055-BL1	-35.8	7642856	689371	055
	PDI-SG-B056-BL1	-33.5	7644246	687969	056
	PDI-SG-B057-BL1	-36.3	7644431	687770	057

**Table 3. Station Location Coordinates, Target Depth and Identification Scheme - Alternate 1 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B058-BL1	-40.1	7644898	687515	058
	PDI-SG-B059-BL1	-47.7	7616840	725267	059
	PDI-SG-B060-BL1	-40.2	7616828	724825	060
	PDI-SG-B061-BL1	-36.0	7616613	724202	061
	PDI-SG-B062-BL1	-49.0	7615976	722710	062
	PDI-SG-B063-BL1	-44.7	7616149	721897	063
	PDI-SG-B064-BL1	-42.2	7616293	720801	064
	PDI-SG-B065-BL1	-44.6	7616596	719209	065
	PDI-SG-B066-BL1	-44.8	7616677	719147	066
	PDI-SG-B067-BL1	-49.2	7617212	717245	067
	PDI-SG-B068-BL1	-38.7	7617742	716682	068
	PDI-SG-B069-BL1	-48.2	7617760	716331	069
	PDI-SG-B070-BL1	-60.6	7618192	715284	070
	PDI-SG-B071-BL1	-30.5	7618937	714212	071
	PDI-SG-B072-BL1	-73.0	7619093	712427	072
	PDI-SG-B073-BL1	-68.3	7619595	711690	073
	PDI-SG-B074-BL1	-76.6	7619897	710892	074
	PDI-SG-B075-BL1	-48.9	7620326	710249	075
	PDI-SG-B076-BL1	-50.6	7621444	709213	076
	PDI-SG-B077-BL1	-45.5	7621842	708527	077
	PDI-SG-B078-BL1	-43.3	7622427	708191	078
	PDI-SG-B079-BL1	-45.1	7622987	707129	079
	PDI-SG-B080-BL1	-45.5	7624057	706156	080
	PDI-SG-B081-BL1	-43.4	7625102	705546	081
	PDI-SG-B082-BL1	-44.9	7625745	705233	082
	PDI-SG-B083-BL1	-45.6	7626979	704305	083
	PDI-SG-B084-BL1	-51.5	7627738	703693	084
	PDI-SG-B085-BL1	-44.5	7627758	703422	085
	PDI-SG-B086-BL1	-57.4	7628985	702636	086
	PDI-SG-B087-BL1	-48.7	7629442	701749	087
	PDI-SG-B088-BL1	-48.8	7630865	701413	088
	PDI-SG-B089-BL1	-37.7	7631753	701154	089
	PDI-SG-B090-BL1	-45.1	7631571	699513	090
	PDI-SG-B091-BL1	-46.3	7632718	699317	091
	PDI-SG-B092-BL1	-36.0	7633422	697819	092
	PDI-SG-B093-BL1	-40.7	7633843	697732	093
	PDI-SG-B094-BL1	-38.6	7635096	696737	094
	PDI-SG-B095-BL1	-69.6	7636321	696317	095
	PDI-SG-B096-BL1	-58.1	7636640	695901	096
	PDI-SG-B097-BL1	-72.7	7637453	695560	097
	PDI-SG-B098-BL1	-42.4	7638855	695037	098
	PDI-SG-B099-BL1	-56.7	7639100	694608	099
	PDI-SG-B100-BL1	-47.0	7640283	692875	100
	PDI-SG-B101-BL1	-46.8	7640372	692794	101
	PDI-SG-B102-BL1	-39.1	7641457	691916	102
	PDI-SG-B103-BL1	-39.0	7642061	691179	103
	PDI-SG-B104-BL1	-50.9	7642919	689973	104
	PDI-SG-B105-BL1	-45.5	7643685	689215	105
	PDI-SG-B106-BL1	-43.7	7643853	688915	106
	PDI-SG-B107-BL1	-46.3	7644650	688183	107
	PDI-SG-B108-BL1	-41.9	7644975	687591	108
	PDI-SG-B109-BL1	-8.4	7616282	726265	109
	PDI-SG-B110-BL1	-40.3	7616548	725688	110
	PDI-SG-B111-BL1	-4.1	7616027	725914	111
	PDI-SG-B112-BL1	NA	7615753	725445	112
	PDI-SG-B113-BL1	-9.7	7615754	725273	113
	PDI-SG-B114-BL1	NA	7615498	724994	114

**Table 3. Station Location Coordinates, Target Depth and Identification Scheme - Alternate 1 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B115-BL1	-38.5	7615786	724386	115
	PDI-SG-B116-BL1	-20.3	7615559	724181	116
	PDI-SG-B117-BL1	NA	7615067	723486	117
	PDI-SG-B118-BL1	NA	7615207	723116	118
	PDI-SG-B119-BL1	-30.8	7615550	722962	119
	PDI-SG-B120-BL1	NA	7615134	722411	120
	PDI-SG-B121-BL1	-54.4	7615504	721924	121
	PDI-SG-B122-BL1	-52.5	7615483	721913	122
	PDI-SG-B123-BL1	-12.7	7615319	721258	123
	PDI-SG-B124-BL1	-31.3	7615590	720897	124
	PDI-SG-B125-BL1	-32.0	7615714	720571	125
	PDI-SG-B126-BL1	-28.2	7615680	720389	126
	PDI-SG-B127-BL1	-25.4	7615742	719872	127
	PDI-SG-B128-BL1	-35.6	7615880	719503	128
	PDI-SG-B129-BL1	-26.3	7615758	719031	129
	PDI-SG-B130-BL1	-37.2	7615994	719055	130
	PDI-SG-B131-BL1	-36.9	7616125	718525	131
	PDI-SG-B132-BL1	-38.7	7616195	718362	132
	PDI-SG-B133-BL1	NA	7615865	717798	133
	PDI-SG-B134-BL1	-17.6	7615987	717524	134
	PDI-SG-B135-BL1	-34.0	7616359	717117	135
	PDI-SG-B136-BL1	-16.8	7616310	716792	136
	PDI-SG-B137-BL1	NA	7616366	716515	137
	PDI-SG-B138-BL1	NA	7616460	716230	138
	PDI-SG-B139-BL1	NA	7616563	715705	139
	PDI-SG-B140-BL1	-17.1	7616929	715258	140
	PDI-SG-B141-BL1	NA	7616885	715150	141
	PDI-SG-B142-BL1	NA	7617056	714711	142
	PDI-SG-B143-BL1	-10.9	7617224	714484	143
	PDI-SG-B144-BL1	-20.5	7617415	714229	144
	PDI-SG-B145-BL1	NA	7617398	713848	145
	PDI-SG-B146-BL1	NA	7617583	713403	146
	PDI-SG-B147-BL1	NA	7617855	713159	147
	PDI-SG-B148-BL1	NA	7617948	712921	148
	PDI-SG-B149-BL1	NA	7618223	712350	149
	PDI-SG-B150-BL1	NA	7618336	711984	150
	PDI-SG-B151-BL1	NA	7618580	711643	151
	PDI-SG-B152-BL1	NA	7618574	711553	152
	PDI-SG-B153-BL1	-32.6	7618972	711176	153
	PDI-SG-B154-BL1	-10.4	7619079	710896	154
	PDI-SG-B155-BL1	-26.7	7619323	710561	155
	PDI-SG-B156-BL1	NA	7619440	710192	156
	PDI-SG-B157-BL1	-5.8	7619625	710052	157
	PDI-SG-B158-BL1	NA	7619869	709722	158
	PDI-SG-B159-BL1	NA	7620050	709523	159
	PDI-SG-B160-BL1	-34.2	7620420	709163	160
	PDI-SG-B161-BL1	-27.9	7620528	708977	161
	PDI-SG-B162-BL1	-9.7	7620734	708599	162
	PDI-SG-B163-BL1	-23.0	7621032	708377	163
	PDI-SG-B164-BL1	NA	7621349	707871	164
	PDI-SG-B165-BL1	NA	7621573	707640	165
	PDI-SG-B166-BL1	-15.7	7621794	707491	166
	PDI-SG-B167-BL1	NA	7621891	707220	167
	PDI-SG-B168-BL1	-45.2	7622401	706943	168
	PDI-SG-B169-BL1	-37.9	7622565	706751	169
	PDI-SG-B170-BL1	-12.8	7622810	706381	170
	PDI-SG-B171-BL1	-6.1	7623062	706155	171

**Table 3. Station Location Coordinates, Target Depth and Identification Scheme - Alternate 1 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
Stratified random Site Samples	PDI-SG-B172-BL1	-31.7	7623557	705973	172
	PDI-SG-B173-BL1	NA	7623676	705840	173
	PDI-SG-B174-BL1	-24.4	7624153	705605	174
	PDI-SG-B175-BL1	NA	7624299	705466	175
	PDI-SG-B176-BL1	-3.5	7624671	705246	176
	PDI-SG-B177-BL1	-20.2	7624975	705116	177
	PDI-SG-B178-BL1	-27.5	7625318	704948	178
	PDI-SG-B179-BL1	-3.7	7625620	704680	179
	PDI-SG-B180-BL1	-8.3	7625880	704515	180
	PDI-SG-B181-BL1	-29.9	7626210	704386	181
	PDI-SG-B182-BL1	-19.8	7626312	704207	182
	PDI-SG-B183-BL1	-14.8	7626453	703983	183
	PDI-SG-B184-BL1	NA	7626591	703548	184
	PDI-SG-B185-BL1	NA	7626777	703403	185
	PDI-SG-B186-BL1	NA	7627211	703069	186
	PDI-SG-B187-BL1	-9.0	7627368	703058	187
	PDI-SG-B188-BL1	NA	7627571	702828	188
	PDI-SG-B189-BL1	-22.7	7628019	702441	189
	PDI-SG-B190-BL1	-27.1	7628264	702193	190
	PDI-SG-B191-BL1	NA	7628289	701973	191
	PDI-SG-B192-BL1	NA	7628414	701345	192
	PDI-SG-B193-BL1	-22.0	7628526	700942	193
	PDI-SG-B194-BL1	-24.7	7628722	700916	194
	PDI-SG-B195-BL1	-35.9	7628885	700698	195
	PDI-SG-B196-BL1	-35.6	7629321	700605	196
	PDI-SG-B197-BL1	-21.5	7629528	700306	197
	PDI-SG-B198-BL1	-11.1	7629819	700145	198
	PDI-SG-B199-BL1	NA	7629925	699940	199
	PDI-SG-B200-BL1	NA	7630275	699607	200
	PDI-SG-B201-BL1	-6.5	7630570	699329	201
	PDI-SG-B202-BL1	-19.9	7630930	699099	202
	PDI-SG-B203-BL1	-4.2	7630943	699010	203
	PDI-SG-B204-BL1	-19.7	7631334	698692	204
	PDI-SG-B205-BL1	-8.9	7631448	698120	205
	PDI-SG-B206-BL1	NA	7631581	697684	206
	PDI-SG-B207-BL1	-11.4	7632007	697635	207
	PDI-SG-B208-BL1	-10.2	7632493	697410	208
	PDI-SG-B209-BL1	-16.4	7632655	697416	209
	PDI-SG-B210-BL1	NA	7632910	696982	210
	PDI-SG-B211-BL1	NA	7633191	696720	211
	PDI-SG-B212-BL1	NA	7633527	696705	212
	PDI-SG-B213-BL1	NA	7633835	696553	213
	PDI-SG-B214-BL1	-12.1	7634284	696334	214
	PDI-SG-B215-BL1	NA	7634495	696094	215
	PDI-SG-B216-BL1	-21.5	7634982	695901	216
	PDI-SG-B217-BL1	-12.9	7635226	695746	217
	PDI-SG-B218-BL1	-15.7	7635570	695775	218
	PDI-SG-B219-BL1	-13.7	7635788	695679	219
	PDI-SG-B220-BL1	-17.8	7636074	695414	220
	PDI-SG-B221-BL1	-13.0	7636408	695327	221
	PDI-SG-B222-BL1	-14.8	7636693	695127	222
	PDI-SG-B223-BL1	-16.5	7637093	694794	223
	PDI-SG-B224-BL1	NA	7637292	694264	224
	PDI-SG-B225-BL1	-32.2	7638037	694350	225
	PDI-SG-B226-BL1	-30.1	7638085	694278	226
	PDI-SG-B227-BL1	NA	7637203	694035	227
	PDI-SG-B228-BL1	-36.1	7638510	693888	228

**Table 3. Station Location Coordinates, Target Depth and Identification Scheme - Alternate 1 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B229-BL1	-36.8	7638613	693822	229
	PDI-SG-B230-BL1	-36.3	7638943	693510	230
	PDI-SG-B231-BL1	-37.4	7639150	693318	231
	PDI-SG-B232-BL1	-35.3	7639332	693108	232
	PDI-SG-B233-BL1	-37.5	7639484	692969	233
	PDI-SG-B234-BL1	-20.0	7639712	692695	234
	PDI-SG-B235-BL1	-20.6	7640014	692316	235
	PDI-SG-B236-BL1	-28.3	7640285	691985	236
	PDI-SG-B237-BL1	-23.9	7640528	691693	237
	PDI-SG-B238-BL1	-19.7	7640529	691656	238
	PDI-SG-B239-BL1	-20.8	7640897	691176	239
	PDI-SG-B240-BL1	-23.2	7640945	690921	240
	PDI-SG-B241-BL1	-19.6	7641371	690628	241
	PDI-SG-B242-BL1	NA	7641435	690512	242
	PDI-SG-B243-BL1	-13.4	7641748	690227	243
	PDI-SG-B244-BL1	-24.4	7641948	690045	244
	PDI-SG-B245-BL1	NA	7642161	689705	245
	PDI-SG-B246-BL1	-12.3	7642660	689274	246
	PDI-SG-B247-BL1	-4.1	7642694	689207	247
	PDI-SG-B248-BL1	NA	7643138	688756	248
	PDI-SG-B249-BL1	NA	7643332	688552	249
	PDI-SG-B250-BL1	NA	7643508	688418	250
	PDI-SG-B251-BL1	-6.9	7643945	688074	251
	PDI-SG-B252-BL1	NA	7643943	687996	252
	PDI-SG-B253-BL1	-16.3	7644250	687763	253
	PDI-SG-B254-BL1	-37.7	7644638	687489	254
	PDI-SG-B255-BL1	-26.4	7644738	687246	255
	PDI-SG-B256-BL1	-47.4	7644945	687133	256
	PDI-SG-B257-BL1	NA	7645143	686734	257
	PDI-SG-B258-BL1	-34.2	7645483	686475	258
	PDI-SG-B259-BL1	-29.3	7617839	725352	259
	PDI-SG-B260-BL1	-44.0	7617485	725360	260
	PDI-SG-B261-BL1	-40.3	7617395	725031	261
	PDI-SG-B262-BL1	-46.1	7617191	724938	262
	PDI-SG-B263-BL1	-34.6	7616902	724555	263
	PDI-SG-B264-BL1	-36.0	7617081	724238	264
	PDI-SG-B265-BL1	-36.4	7617143	723919	265
	PDI-SG-B266-BL1	-19.0	7617188	723606	266
	PDI-SG-B267-BL1	-35.6	7616625	723277	267
	PDI-SG-B268-BL1	-22.8	7616976	722999	268
	PDI-SG-B269-BL1	-27.6	7616881	722557	269
	PDI-SG-B270-BL1	-44.3	7616353	722247	270
	PDI-SG-B271-BL1	-25.3	7616771	722025	271
	PDI-SG-B272-BL1	-45.2	7616411	721789	272
	PDI-SG-B273-BL1	-39.1	7616374	721310	273
	PDI-SG-B274-BL1	-35.2	7616734	721093	274
	PDI-SG-B275-BL1	-31.7	7616767	720949	275
	PDI-SG-B276-BL1	-40.0	7616628	720538	276
	PDI-SG-B277-BL1	-37.8	7616789	720115	277
	PDI-SG-B278-BL1	-35.5	7616853	719764	278
	PDI-SG-B279-BL1	-31.8	7616890	719611	279
	PDI-SG-B280-BL1	-44.7	7616808	719129	280
	PDI-SG-B281-BL1	NA	7617165	718875	281
	PDI-SG-B282-BL1	-23.6	7617243	718457	282
	PDI-SG-B283-BL1	-27.9	7617337	718102	283
	PDI-SG-B284-BL1	-37.4	7617502	717637	284
	PDI-SG-B285-BL1	-27.0	7617585	717530	285

**Table 3. Station Location Coordinates, Target Depth and Identification Scheme - Alternate 1 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B286-BL1	NA	7617977	717009	286
	PDI-SG-B287-BL1	-31.9	7617797	716947	287
	PDI-SG-B288-BL1	-33.0	7617927	716563	288
	PDI-SG-B289-BL1	-20.6	7618167	716262	289
	PDI-SG-B290-BL1	NA	7618345	715904	290
	PDI-SG-B291-BL1	NA	7618377	715790	291
	PDI-SG-B292-BL1	-50.7	7618443	715354	292
	PDI-SG-B293-BL1	-39.2	7618599	715081	293
	PDI-SG-B294-BL1	-37.6	7618808	714622	294
	PDI-SG-B295-BL1	-35.5	7618974	714476	295
	PDI-SG-B296-BL1	-8.3	7619226	713958	296
	PDI-SG-B297-BL1	-13.9	7619330	713818	297
	PDI-SG-B298-BL1	-18.4	7619469	713611	298
	PDI-SG-B299-BL1	-22.6	7619606	713081	299
	PDI-SG-B300-BL1	-26.7	7619647	712853	300
	PDI-SG-B301-BL1	-36.4	7619765	712468	301
	PDI-SG-B302-BL1	-40.6	7619818	712318	302
	PDI-SG-B303-BL1	-40.9	7620012	711902	303
	PDI-SG-B304-BL1	-21.4	7620382	711469	304
	PDI-SG-B305-BL1	NA	7620566	711189	305
	PDI-SG-B306-BL1	NA	7620622	711111	306
	PDI-SG-B307-BL1	NA	7620677	710781	307
	PDI-SG-B308-BL1	-28.7	7620899	710478	308
	PDI-SG-B309-BL1	-27.6	7621101	710130	309
	PDI-SG-B310-BL1	-28.1	7621340	709673	310
	PDI-SG-B311-BL1	-9.4	7621536	709473	311
	PDI-SG-B312-BL1	-32.3	7621684	709069	312
	PDI-SG-B313-BL1	-31.3	7621763	708984	313
	PDI-SG-B314-BL1	NA	7622166	708861	314
	PDI-SG-B315-BL1	-42.7	7622246	708386	315
	PDI-SG-B316-BL1	-41.6	7622400	708246	316
	PDI-SG-B317-BL1	-43.0	7622686	707913	317
	PDI-SG-B318-BL1	-24.4	7622884	707841	318
	PDI-SG-B319-BL1	-46.7	7623202	707260	319
	PDI-SG-B320-BL1	-15.1	7623591	707240	320
	PDI-SG-B321-BL1	-49.1	7623615	706891	321
	PDI-SG-B322-BL1	-54.3	7623717	706792	322
	PDI-SG-B323-BL1	NA	7624373	706838	323
	PDI-SG-B324-BL1	-43.2	7624338	706531	324
	PDI-SG-B325-BL1	-5.1	7625010	706395	325
	PDI-SG-B326-BL1	-44.6	7625116	705880	326
	PDI-SG-B327-BL1	-43.7	7625362	705714	327
	PDI-SG-B328-BL1	-44.6	7625695	705666	328
	PDI-SG-B329-BL1	-14.2	7626309	705803	329
	PDI-SG-B330-BL1	-44.4	7626419	705408	330
	PDI-SG-B331-BL1	-25.6	7626962	705693	331
	PDI-SG-B332-BL1	-19.3	7626961	705341	332
	PDI-SG-B333-BL1	-40.4	7626985	704699	333
	PDI-SG-B334-BL1	-47.6	7627460	704408	334
	PDI-SG-B335-BL1	NA	7628062	704705	335
	PDI-SG-B336-BL1	NA	7628392	704299	336
	PDI-SG-B337-BL1	-52.4	7628310	703630	337
	PDI-SG-B338-BL1	-31.3	7628748	703617	338
	PDI-SG-B339-BL1	-61.0	7628761	703099	339
	PDI-SG-B340-BL1	-7.4	7629505	703373	340
	PDI-SG-B341-BL1	-33.2	7629516	702753	341
	PDI-SG-B342-BL1	-34.1	7629646	702719	342

**Table 3. Station Location Coordinates, Target Depth and Identification Scheme - Alternate 1 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B343-BL1	-26.4	7629938	702546	343
	PDI-SG-B344-BL1	-18.7	7630344	702345	344
	PDI-SG-B345-BL1	-19.5	7630526	702133	345
	PDI-SG-B346-BL1	-27.7	7630892	701871	346
	PDI-SG-B347-BL1	-13.6	7631191	701807	347
	PDI-SG-B348-BL1	-4.0	7631594	701663	348
	PDI-SG-B349-BL1	-30.1	7631861	701546	349
	PDI-SG-B350-BL1	-37.4	7632135	701356	350
	PDI-SG-B351-BL1	-44.5	7631715	700331	351
	PDI-SG-B352-BL1	-44.0	7632000	700026	352
	PDI-SG-B353-BL1	-41.7	7632075	699989	353
	PDI-SG-B354-BL1	-40.0	7632256	699842	354
	PDI-SG-B355-BL1	-43.9	7632657	699434	355
	PDI-SG-B356-BL1	-46.3	7632923	699176	356
	PDI-SG-B357-BL1	-46.5	7633102	699046	357
	PDI-SG-B358-BL1	-45.9	7633367	698840	358
	PDI-SG-B359-BL1	-37.3	7633688	698651	359
	PDI-SG-B360-BL1	-35.5	7633929	698505	360
	PDI-SG-B361-BL1	-16.7	7634149	698433	361
	PDI-SG-B362-BL1	-36.5	7634401	698094	362
	PDI-SG-B363-BL1	-7.1	7634747	697980	363
	PDI-SG-B364-BL1	-13.1	7634961	697805	364
	PDI-SG-B365-BL1	-25.5	7635457	697355	365
	PDI-SG-B366-BL1	-23.7	7635715	697179	366
	PDI-SG-B367-BL1	-25.7	7635856	697085	367
	PDI-SG-B368-BL1	-38.6	7636094	696824	368
	PDI-SG-B369-BL1	-18.2	7636499	696736	369
	PDI-SG-B370-BL1	-15.0	7636787	696509	370
	PDI-SG-B371-BL1	-27.7	7637010	696302	371
	PDI-SG-B372-BL1	-10.5	7637478	696152	372
	PDI-SG-B373-BL1	-24.3	7637545	696043	373
	PDI-SG-B374-BL1	-8.6	7637992	695792	374
	PDI-SG-B375-BL1	-23.0	7638277	695566	375
	PDI-SG-B376-BL1	NA	7638737	695594	376
	PDI-SG-B377-BL1	NA	7638928	695431	377
	PDI-SG-B378-BL1	-30.9	7639272	695012	378
	PDI-SG-B379-BL1	-33.4	7639664	694814	379
	PDI-SG-B380-BL1	-35.6	7639878	694462	380
	PDI-SG-B381-BL1	-36.6	7639952	694271	381
	PDI-SG-B382-BL1	-16.7	7640365	693728	382
	PDI-SG-B383-BL1	-37.5	7640328	693660	383
	PDI-SG-B384-BL1	-24.7	7640565	693293	384
	PDI-SG-B385-BL1	-32.6	7640731	692984	385
	PDI-SG-B386-BL1	-25.8	7640892	692805	386
	PDI-SG-B387-BL1	-22.5	7641123	692545	387
	PDI-SG-B388-BL1	-10.9	7641457	692142	388
	PDI-SG-B389-BL1	-31.8	7641600	691867	389
	PDI-SG-B390-BL1	-20.4	7641921	691545	390
	PDI-SG-B391-BL1	-28.0	7642133	691225	391
	PDI-SG-B392-BL1	-12.1	7642281	691121	392
	PDI-SG-B393-BL1	-25.5	7642466	690815	393
	PDI-SG-B394-BL1	-31.2	7642734	690472	394
	PDI-SG-B395-BL1	-39.9	7642982	690186	395
	PDI-SG-B396-BL1	-26.0	7643210	690030	396
	PDI-SG-B397-BL1	-27.6	7643583	689759	397
	PDI-SG-B398-BL1	-20.2	7643658	689753	398
	PDI-SG-B399-BL1	-44.1	7643882	689426	399

**Table 3. Station Location Coordinates, Target Depth and Identification Scheme - Alternate 1 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B400-BL1	-34.7	7644258	689173	400
	PDI-SG-B401-BL1	-38.3	7644488	689104	401
	PDI-SG-B402-BL1	-40.9	7644717	688741	402
	PDI-SG-B403-BL1	-35.6	7644893	688390	403
	PDI-SG-B404-BL1	-31.3	7645028	688138	404
	PDI-SG-B405-BL1	-39.7	7645197	687529	405
	PDI-SG-B406-BL1	-52.8	7645287	687204	406
	PDI-SG-B407-BL1	-57.1	7645398	687127	407
	PDI-SG-B408-BL1	-65.3	7645809	686741	408
	PDI-SG-B409-BL1	NA	7636585	698506	409
	PDI-SG-B410-BL1	-17.8	7636525	699214	410
	PDI-SG-B411-BL1	-20.9	7636206	699075	411
	PDI-SG-B412-BL1	-21.9	7636042	699289	412
	PDI-SG-B413-BL1	-22.7	7635728	699437	413
	PDI-SG-B414-BL1	-25.1	7635582	699715	414
	PDI-SG-B415-BL1	-28.8	7635119	700093	415
	PDI-SG-B416-BL1	-29.2	7635006	700392	416
	PDI-SG-B417-BL1	NA	7634966	700543	417
	PDI-SG-B418-BL1	-32.2	7634388	700659	418
	PDI-SG-B419-BL1	NA	7634298	701173	419
	PDI-SG-B420-BL1	-31.7	7633863	701183	420
	PDI-SG-B421-BL1	-33.4	7633606	701155	421
	PDI-SG-B422-BL1	-15.5	7633541	701819	422
	PDI-SG-B423-BL1	-16.6	7633029	701876	423
	PDI-SG-B424-BL1	-32.5	7632936	701293	424
	PDI-SG-B425-BL1	-36.0	7632377	701500	425
	PDI-SG-B426-BL1	-45.1	7632373	700926	426
	PDI-SG-B427-BL1	-37.5	7631944	700948	427
	PDI-SG-B428-BL1	-58.6	7632190	700343	428

**Notes:**

All surface sediment samples have a target depth of 30 centimeters.

Conversion From CRD to NAVD88: Elevation(CRD)+5.38=NAVD88

**Footnotes:**

a) Vertical Datum: CRD (feet); based on 2009 NOAA bathymetry

b) Horizontal Projection: NAD 1983 Oregon State Plane North (Intl Feet)

**Acronyms:**

CRD = Columbia River Datum; ID = identification number; NA = not available; NAD = North American Datum; NAVD88 = North American Vertical Datum of 1988; NOAA = National Oceanic and Atmospheric Administration

**Table 4. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 2 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B001-BL1	-35.6	7612776	720637	001
	PDI-SG-B002-BL1	-29.5	7613524	720413	002
	PDI-SG-B003-BL1	-55.7	7614371	720298	003
	PDI-SG-B004-BL1	-2.1	7619062	717292	004
	PDI-SG-B005-BL1	-16.8	7618769	717243	005
	PDI-SG-B006-BL1	-11.7	7619703	714721	006
	PDI-SG-B007-BL1	-32.7	7619048	714611	007
	PDI-SG-B008-BL1	-29.7	7620299	713073	008
	PDI-SG-B009-BL1	-42.0	7616943	725971	009
	PDI-SG-B010-BL1	-52.3	7616077	724419	010
	PDI-SG-B011-BL1	-48.6	7616249	724341	011
	PDI-SG-B012-BL1	-41.1	7615701	723293	012
	PDI-SG-B013-BL1	-48.9	7615857	721824	013
	PDI-SG-B014-BL1	-44.9	7615985	721222	014
	PDI-SG-B015-BL1	-45.7	7616295	719143	015
	PDI-SG-B016-BL1	-46.6	7616412	718543	016
	PDI-SG-B017-BL1	-45.8	7616768	717643	017
	PDI-SG-B018-BL1	-52.3	7616995	716723	018
	PDI-SG-B019-BL1	-42.9	7617097	715812	019
	PDI-SG-B020-BL1	-42.3	7617575	714727	020
	PDI-SG-B021-BL1	-23.0	7617603	713892	021
	PDI-SG-B022-BL1	-51.2	7618313	712995	022
	PDI-SG-B023-BL1	-41.4	7618909	711696	023
	PDI-SG-B024-BL1	-59.2	7619735	710763	024
	PDI-SG-B025-BL1	-37.7	7619926	709916	025
	PDI-SG-B026-BL1	-46.2	7620552	709379	026
	PDI-SG-B027-BL1	-45.9	7621917	707875	027
	PDI-SG-B028-BL1	-50.8	7621933	707604	028
	PDI-SG-B029-BL1	-46.5	7622606	706919	029
	PDI-SG-B030-BL1	-43.9	7623883	706133	030
	PDI-SG-B031-BL1	-44.4	7625134	705332	031
	PDI-SG-B032-BL1	-41.4	7625612	704831	032
	PDI-SG-B033-BL1	-45.3	7626190	704676	033
	PDI-SG-B034-BL1	-43.4	7627193	703745	034
	PDI-SG-B035-BL1	-37.8	7627608	703221	035
	PDI-SG-B036-BL1	-35.7	7628485	702173	036
	PDI-SG-B037-BL1	-35.8	7629149	701427	037
	PDI-SG-B038-BL1	-40.9	7629773	701024	038
	PDI-SG-B039-BL1	-27.6	7630671	699562	039
	PDI-SG-B040-BL1	-38.8	7631675	699229	040
	PDI-SG-B041-BL1	-30.0	7631792	698299	041
	PDI-SG-B042-BL1	-31.6	7633229	697118	042
	PDI-SG-B043-BL1	-31.1	7633389	697203	043
	PDI-SG-B044-BL1	-23.7	7634223	696535	044
	PDI-SG-B045-BL1	-39.1	7635985	696156	045
	PDI-SG-B046-BL1	-48.8	7636727	695747	046
	PDI-SG-B047-BL1	-28.1	7637055	695181	047
	PDI-SG-B048-BL1	-42.9	7638584	694585	048
	PDI-SG-B049-BL1	-41.7	7639104	694120	049
	PDI-SG-B050-BL1	-46.3	7639919	693047	050
	PDI-SG-B051-BL1	-48.1	7640442	692040	051
	PDI-SG-B052-BL1	-30.6	7641006	691120	052
	PDI-SG-B053-BL1	-51.1	7641791	690581	053
	PDI-SG-B054-BL1	-46.7	7642173	689929	054
	PDI-SG-B055-BL1	-12.7	7643417	688613	055

**Table 4. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 2 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B056-BL1	-33.9	7643759	688481	056
	PDI-SG-B057-BL1	-38.0	7644541	687828	057
	PDI-SG-B058-BL1	-45.3	7644976	687479	058
	PDI-SG-B059-BL1	-47.8	7617134	725466	059
	PDI-SG-B060-BL1	-46.2	7616619	724841	060
	PDI-SG-B061-BL1	-39.7	7616377	723696	061
	PDI-SG-B062-BL1	-43.2	7616263	723293	062
	PDI-SG-B063-BL1	-48.0	7615916	721814	063
	PDI-SG-B064-BL1	-43.3	7616154	720599	064
	PDI-SG-B065-BL1	-46.8	7616640	719704	065
	PDI-SG-B066-BL1	-46.0	7616798	718408	066
	PDI-SG-B067-BL1	-51.0	7617124	717233	067
	PDI-SG-B068-BL1	-40.5	7617815	716439	068
	PDI-SG-B069-BL1	-41.5	7617947	716029	069
	PDI-SG-B070-BL1	-64.5	7618343	714911	070
	PDI-SG-B071-BL1	-51.2	7618817	714064	071
	PDI-SG-B072-BL1	-73.2	7619068	712732	072
	PDI-SG-B073-BL1	-69.5	7619446	712180	073
	PDI-SG-B074-BL1	-68.2	7620102	710514	074
	PDI-SG-B075-BL1	-53.5	7620243	710456	075
	PDI-SG-B076-BL1	-52.1	7620930	709605	076
	PDI-SG-B077-BL1	-46.3	7622006	708148	077
	PDI-SG-B078-BL1	-47.9	7622419	708016	078
	PDI-SG-B079-BL1	-48.0	7623265	706949	079
	PDI-SG-B080-BL1	-46.2	7623978	706272	080
	PDI-SG-B081-BL1	-49.4	7624793	705691	081
	PDI-SG-B082-BL1	-44.5	7625828	705179	082
	PDI-SG-B083-BL1	-43.7	7626858	704403	083
	PDI-SG-B084-BL1	-43.3	7627238	704258	084
	PDI-SG-B085-BL1	-44.7	7627760	703449	085
	PDI-SG-B086-BL1	-51.5	7628649	702734	086
	PDI-SG-B087-BL1	-32.3	7630363	701971	087
	PDI-SG-B088-BL1	-53.3	7630434	701066	088
	PDI-SG-B089-BL1	-45.2	7631376	700488	089
	PDI-SG-B090-BL1	-48.3	7632011	699460	090
	PDI-SG-B091-BL1	-49.0	7632336	699365	091
	PDI-SG-B092-BL1	-47.6	7633517	698268	092
	PDI-SG-B093-BL1	-48.6	7634491	697451	093
	PDI-SG-B094-BL1	-40.7	7635287	696651	094
	PDI-SG-B095-BL1	-42.6	7635621	696816	095
	PDI-SG-B096-BL1	-70.3	7636681	696087	096
	PDI-SG-B097-BL1	-52.2	7637714	695215	097
	PDI-SG-B098-BL1	-50.7	7638542	695107	098
	PDI-SG-B099-BL1	-43.5	7639579	694249	099
	PDI-SG-B100-BL1	-38.1	7640197	693484	100
	PDI-SG-B101-BL1	-45.7	7640935	692176	101
	PDI-SG-B102-BL1	-43.5	7641324	691939	102
	PDI-SG-B103-BL1	-62.8	7642279	690634	103
	PDI-SG-B104-BL1	-52.5	7642860	690013	104
	PDI-SG-B105-BL1	-43.6	7643676	689022	105
	PDI-SG-B106-BL1	-54.9	7644487	688429	106
	PDI-SG-B107-BL1	-36.9	7645040	687776	107
	PDI-SG-B108-BL1	-39.4	7645069	687610	108
	PDI-SG-B109-BL1	-19.7	7616377	726091	109
	PDI-SG-B110-BL1	-17.2	7616271	726051	110

**Table 4. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 2 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B111-BL1	-28.6	7616221	725647	111
	PDI-SG-B112-BL1	NA	7615737	725649	112
	PDI-SG-B113-BL1	-19.2	7615840	724957	113
	PDI-SG-B114-BL1	-13.3	7615578	724653	114
	PDI-SG-B115-BL1	NA	7615399	724417	115
	PDI-SG-B116-BL1	NA	7615382	724054	116
	PDI-SG-B117-BL1	NA	7615221	723824	117
	PDI-SG-B118-BL1	-35.0	7615623	723259	118
	PDI-SG-B119-BL1	-26.2	7615446	722963	119
	PDI-SG-B120-BL1	-26.0	7615363	722562	120
	PDI-SG-B121-BL1	-51.5	7615475	721934	121
	PDI-SG-B122-BL1	-56.2	7615504	721834	122
	PDI-SG-B123-BL1	NA	7615060	721348	123
	PDI-SG-B124-BL1	-12.4	7615386	721064	124
	PDI-SG-B125-BL1	-6.1	7615091	720665	125
	PDI-SG-B126-BL1	-18.4	7615200	720118	126
	PDI-SG-B127-BL1	-21.5	7615568	719957	127
	PDI-SG-B128-BL1	-18.6	7615664	719409	128
	PDI-SG-B129-BL1	-18.6	7615744	719333	129
	PDI-SG-B130-BL1	-27.6	7615736	718984	130
	PDI-SG-B131-BL1	-22.8	7615698	718370	131
	PDI-SG-B132-BL1	-24.0	7615760	718200	132
	PDI-SG-B133-BL1	-34.9	7616024	717834	133
	PDI-SG-B134-BL1	-30.8	7616096	717450	134
	PDI-SG-B135-BL1	-35.3	7616393	717155	135
	PDI-SG-B136-BL1	-18.9	7616260	716927	136
	PDI-SG-B137-BL1	-30.2	7616484	716613	137
	PDI-SG-B138-BL1	-27.8	7616621	716173	138
	PDI-SG-B139-BL1	NA	7616649	715759	139
	PDI-SG-B140-BL1	NA	7616784	715123	140
	PDI-SG-B141-BL1	-31.2	7617099	714940	141
	PDI-SG-B142-BL1	NA	7617111	714515	142
	PDI-SG-B143-BL1	-23.6	7617271	714445	143
	PDI-SG-B144-BL1	NA	7617345	713934	144
	PDI-SG-B145-BL1	NA	7617541	713645	145
	PDI-SG-B146-BL1	NA	7617569	713431	146
	PDI-SG-B147-BL1	NA	7617754	713228	147
	PDI-SG-B148-BL1	NA	7617938	712904	148
	PDI-SG-B149-BL1	NA	7618118	712556	149
	PDI-SG-B150-BL1	-8.3	7618399	712140	150
	PDI-SG-B151-BL1	NA	7618424	711813	151
	PDI-SG-B152-BL1	NA	7618697	711320	152
	PDI-SG-B153-BL1	-26.0	7619007	711080	153
	PDI-SG-B154-BL1	-13.3	7619164	710754	154
	PDI-SG-B155-BL1	-30.7	7619385	710529	155
	PDI-SG-B156-BL1	-30.9	7619534	710300	156
	PDI-SG-B157-BL1	-25.7	7619724	710070	157
	PDI-SG-B158-BL1	-20.8	7619892	709838	158
	PDI-SG-B159-BL1	NA	7620043	709540	159
	PDI-SG-B160-BL1	NA	7620278	709210	160
	PDI-SG-B161-BL1	-34.3	7620564	708987	161
	PDI-SG-B162-BL1	-16.4	7620842	708501	162
	PDI-SG-B163-BL1	NA	7620934	708388	163
	PDI-SG-B164-BL1	-8.3	7621336	707959	164
	PDI-SG-B165-BL1	-11.8	7621609	707635	165

**Table 4. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 2 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
Stratified random Site Samples	PDI-SG-B166-BL1	NA	7621852	707376	166
	PDI-SG-B167-BL1	NA	7622005	707081	167
	PDI-SG-B168-BL1	-17.8	7622142	707084	168
	PDI-SG-B169-BL1	NA	7622382	706381	169
	PDI-SG-B170-BL1	-8.2	7622742	706366	170
	PDI-SG-B171-BL1	-40.1	7623056	706371	171
	PDI-SG-B172-BL1	NA	7623233	706008	172
	PDI-SG-B173-BL1	-8.3	7623629	705877	173
	PDI-SG-B174-BL1	NA	7623930	705616	174
	PDI-SG-B175-BL1	NA	7624270	705419	175
	PDI-SG-B176-BL1	NA	7624645	705214	176
	PDI-SG-B177-BL1	-12.1	7625041	705063	177
	PDI-SG-B178-BL1	NA	7625242	704873	178
	PDI-SG-B179-BL1	-14.9	7625469	704820	179
	PDI-SG-B180-BL1	-7.4	7625698	704652	180
	PDI-SG-B181-BL1	NA	7626153	704203	181
	PDI-SG-B182-BL1	-30.1	7626400	704222	182
	PDI-SG-B183-BL1	NA	7626497	703793	183
	PDI-SG-B184-BL1	-31.2	7626894	703712	184
	PDI-SG-B185-BL1	NA	7626762	703468	185
	PDI-SG-B186-BL1	NA	7627197	703039	186
	PDI-SG-B187-BL1	-9.5	7627458	702988	187
	PDI-SG-B188-BL1	-7.1	7627772	702610	188
	PDI-SG-B189-BL1	-15.2	7627838	702600	189
	PDI-SG-B190-BL1	-17.2	7628147	702267	190
	PDI-SG-B191-BL1	NA	7628341	701919	191
	PDI-SG-B192-BL1	NA	7628508	701512	192
	PDI-SG-B193-BL1	-7.9	7628461	701096	193
	PDI-SG-B194-BL1	-27.3	7629020	701157	194
	PDI-SG-B195-BL1	-13.9	7628637	700563	195
	PDI-SG-B196-BL1	-15.4	7628987	700193	196
	PDI-SG-B197-BL1	-7.2	7629535	700190	197
	PDI-SG-B198-BL1	-17.4	7629766	700259	198
	PDI-SG-B199-BL1	-34.5	7630182	699945	199
	PDI-SG-B200-BL1	-7.2	7630229	699717	200
	PDI-SG-B201-BL1	-22.6	7630713	699334	201
	PDI-SG-B202-BL1	NA	7630660	699092	202
	PDI-SG-B203-BL1	-20.7	7630999	699062	203
	PDI-SG-B204-BL1	-14.4	7631397	698499	204
	PDI-SG-B205-BL1	NA	7631295	698075	205
	PDI-SG-B206-BL1	-13.1	7631722	697897	206
	PDI-SG-B207-BL1	-7.6	7632184	697782	207
	PDI-SG-B208-BL1	-9.0	7632311	697578	208
	PDI-SG-B209-BL1	NA	7632702	697028	209
	PDI-SG-B210-BL1	NA	7632917	696924	210
	PDI-SG-B211-BL1	-17.5	7633236	696937	211
	PDI-SG-B212-BL1	-21.8	7633592	696749	212
	PDI-SG-B213-BL1	NA	7633926	696492	213
	PDI-SG-B214-BL1	NA	7634314	696255	214
	PDI-SG-B215-BL1	-14.2	7634608	696084	215
	PDI-SG-B216-BL1	NA	7634716	696024	216
	PDI-SG-B217-BL1	-17.0	7635243	695793	217
	PDI-SG-B218-BL1	-20.1	7635543	695681	218
	PDI-SG-B219-BL1	-17.2	7635639	695548	219
	PDI-SG-B220-BL1	-11.9	7636108	695543	220

**Table 4. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 2 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B221-BL1	-20.5	7636294	695195	221
	PDI-SG-B222-BL1	-18.3	7636525	694990	222
	PDI-SG-B223-BL1	NA	7636797	694818	223
	PDI-SG-B224-BL1	-31.3	7637304	694866	224
	PDI-SG-B225-BL1	-30.5	7637980	694375	225
	PDI-SG-B226-BL1	-31.5	7638291	694117	226
	PDI-SG-B227-BL1	NA	7637200	694055	227
	PDI-SG-B228-BL1	-30.9	7638407	693996	228
	PDI-SG-B229-BL1	-36.9	7638754	693684	229
	PDI-SG-B230-BL1	-35.9	7638917	693531	230
	PDI-SG-B231-BL1	-36.0	7639043	693394	231
	PDI-SG-B232-BL1	-37.9	7639263	693205	232
	PDI-SG-B233-BL1	NA	7639510	692893	233
	PDI-SG-B234-BL1	-14.6	7639850	692508	234
	PDI-SG-B235-BL1	-28.0	7639952	692418	235
	PDI-SG-B236-BL1	-28.0	7640259	692030	236
	PDI-SG-B237-BL1	-22.0	7640382	691855	237
	PDI-SG-B238-BL1	-22.0	7640650	691523	238
	PDI-SG-B239-BL1	-24.1	7640940	691133	239
	PDI-SG-B240-BL1	-21.1	7640908	690928	240
	PDI-SG-B241-BL1	-24.0	7641396	690660	241
	PDI-SG-B242-BL1	-7.4	7641526	690408	242
	PDI-SG-B243-BL1	-19.6	7641720	690295	243
	PDI-SG-B244-BL1	-19.9	7642020	689921	244
	PDI-SG-B245-BL1	-36.6	7642208	689751	245
	PDI-SG-B246-BL1	NA	7642506	689336	246
	PDI-SG-B247-BL1	NA	7642818	689089	247
	PDI-SG-B248-BL1	-8.6	7643081	688894	248
	PDI-SG-B249-BL1	-5.1	7643221	688747	249
	PDI-SG-B250-BL1	NA	7643478	688422	250
	PDI-SG-B251-BL1	-9.6	7643738	688201	251
	PDI-SG-B252-BL1	-16.7	7644188	687835	252
	PDI-SG-B253-BL1	-25.2	7644372	687654	253
	PDI-SG-B254-BL1	-40.8	7644703	687537	254
	PDI-SG-B255-BL1	-39.2	7644856	687437	255
	PDI-SG-B256-BL1	-47.4	7645012	687197	256
	PDI-SG-B257-BL1	-59.8	7645391	686932	257
	PDI-SG-B258-BL1	-61.3	7645586	686604	258
	PDI-SG-B259-BL1	-26.3	7617834	725168	259
	PDI-SG-B260-BL1	-41.7	7617479	725278	260
	PDI-SG-B261-BL1	-44.5	7617626	724935	261
	PDI-SG-B262-BL1	-50.0	7617515	724839	262
	PDI-SG-B263-BL1	-3.8	7617612	724560	263
	PDI-SG-B264-BL1	-28.3	7617346	724177	264
	PDI-SG-B265-BL1	-34.2	7616801	724053	265
	PDI-SG-B266-BL1	NA	7617223	723613	266
	PDI-SG-B267-BL1	-34.1	7616719	723278	267
	PDI-SG-B268-BL1	-38.4	7616728	722964	268
	PDI-SG-B269-BL1	-40.2	7616480	722718	269
	PDI-SG-B270-BL1	NA	7616910	722288	270
	PDI-SG-B271-BL1	-42.0	7616457	721924	271
	PDI-SG-B272-BL1	-45.0	7616314	721763	272
	PDI-SG-B273-BL1	-40.9	7616448	721570	273
	PDI-SG-B274-BL1	-38.0	7616420	721093	274
	PDI-SG-B275-BL1	-39.1	7616677	720945	275

**Table 4. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 2 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B276-BL1	NA	7616881	720497	276
	PDI-SG-B277-BL1	-29.6	7616836	720076	277
	PDI-SG-B278-BL1	-40.6	7616792	719820	278
	PDI-SG-B279-BL1	-40.8	7616831	719591	279
	PDI-SG-B280-BL1	-33.0	7616925	719234	280
	PDI-SG-B281-BL1	-29.1	7617142	718605	281
	PDI-SG-B282-BL1	-9.0	7617284	718490	282
	PDI-SG-B283-BL1	-27.2	7617362	718050	283
	PDI-SG-B284-BL1	-44.2	7617299	717859	284
	PDI-SG-B285-BL1	NA	7617710	717637	285
	PDI-SG-B286-BL1	-38.7	7617738	716994	286
	PDI-SG-B287-BL1	-31.3	7617839	716865	287
	PDI-SG-B288-BL1	-33.6	7617922	716573	288
	PDI-SG-B289-BL1	-26.0	7618106	716309	289
	PDI-SG-B290-BL1	NA	7618315	716112	290
	PDI-SG-B291-BL1	-24.4	7618459	715559	291
	PDI-SG-B292-BL1	-25.2	7618490	715498	292
	PDI-SG-B293-BL1	-32.7	7618689	714972	293
	PDI-SG-B294-BL1	-30.6	7618808	714733	294
	PDI-SG-B295-BL1	-35.8	7618975	714490	295
	PDI-SG-B296-BL1	-28.6	7619024	714069	296
	PDI-SG-B297-BL1	-12.8	7619364	713782	297
	PDI-SG-B298-BL1	-40.8	7619366	713577	298
	PDI-SG-B299-BL1	-42.3	7619519	712938	299
	PDI-SG-B300-BL1	-18.5	7619685	712890	300
	PDI-SG-B301-BL1	-40.0	7619807	712334	301
	PDI-SG-B302-BL1	-38.9	7619955	712080	302
	PDI-SG-B303-BL1	-39.3	7620035	711942	303
	PDI-SG-B304-BL1	-41.9	7620151	711618	304
	PDI-SG-B305-BL1	-34.9	7620343	711375	305
	PDI-SG-B306-BL1	-34.1	7620599	710908	306
	PDI-SG-B307-BL1	-10.9	7620891	710635	307
	PDI-SG-B308-BL1	-19.6	7620947	710440	308
	PDI-SG-B309-BL1	-9.3	7621165	710157	309
	PDI-SG-B310-BL1	NA	7621274	709917	310
	PDI-SG-B311-BL1	-32.4	7621419	709478	311
	PDI-SG-B312-BL1	-33.7	7621581	709198	312
	PDI-SG-B313-BL1	NA	7622096	708966	313
	PDI-SG-B314-BL1	NA	7622153	708843	314
	PDI-SG-B315-BL1	-38.2	7622270	708386	315
	PDI-SG-B316-BL1	NA	7622549	708336	316
	PDI-SG-B317-BL1	-13.2	7622700	708040	317
	PDI-SG-B318-BL1	-42.9	7622936	707486	318
	PDI-SG-B319-BL1	-46.1	7623185	707261	319
	PDI-SG-B320-BL1	-10.8	7623647	707207	320
	PDI-SG-B321-BL1	-29.2	7623720	707088	321
	PDI-SG-B322-BL1	-54.3	7623855	706585	322
	PDI-SG-B323-BL1	-42.7	7624262	706597	323
	PDI-SG-B324-BL1	-44.1	7624430	706440	324
	PDI-SG-B325-BL1	-31.4	7624942	706234	325
	PDI-SG-B326-BL1	-43.7	7625184	705962	326
	PDI-SG-B327-BL1	-43.7	7625222	705825	327
	PDI-SG-B328-BL1	-15.5	7625780	705954	328
	PDI-SG-B329-BL1	-10.3	7626116	705901	329
	PDI-SG-B330-BL1	-43.5	7626239	705150	330

**Table 4. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 2 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B331-BL1	-44.4	7626665	705117	331
	PDI-SG-B332-BL1	-21.8	7626908	705162	332
	PDI-SG-B333-BL1	-48.3	7627040	704569	333
	PDI-SG-B334-BL1	NA	7627719	704556	334
	PDI-SG-B335-BL1	-9.5	7628000	704316	335
	PDI-SG-B336-BL1	NA	7628117	704266	336
	PDI-SG-B337-BL1	-30.5	7628325	704014	337
	PDI-SG-B338-BL1	-25.6	7628703	703697	338
	PDI-SG-B339-BL1	-44.3	7628854	703323	339
	PDI-SG-B340-BL1	-36.0	7629233	703008	340
	PDI-SG-B341-BL1	-11.3	7629574	703243	341
	PDI-SG-B342-BL1	-45.5	7629458	702531	342
	PDI-SG-B343-BL1	-27.5	7630134	702348	343
	PDI-SG-B344-BL1	-28.1	7630283	702218	344
	PDI-SG-B345-BL1	-9.2	7630521	702212	345
	PDI-SG-B346-BL1	-29.0	7630898	701858	346
	PDI-SG-B347-BL1	-24.8	7631224	701766	347
	PDI-SG-B348-BL1	-10.6	7631639	701630	348
	PDI-SG-B349-BL1	-34.2	7631695	701522	349
	PDI-SG-B350-BL1	-35.9	7632245	701501	350
	PDI-SG-B351-BL1	NA	7631624	700456	351
	PDI-SG-B352-BL1	-43.9	7631844	700238	352
	PDI-SG-B353-BL1	-43.8	7632185	699799	353
	PDI-SG-B354-BL1	-41.1	7632426	699681	354
	PDI-SG-B355-BL1	-36.6	7632801	699446	355
	PDI-SG-B356-BL1	-42.2	7633024	699193	356
	PDI-SG-B357-BL1	-39.5	7633193	699058	357
	PDI-SG-B358-BL1	-41.9	7633438	698814	358
	PDI-SG-B359-BL1	-39.2	7633644	698627	359
	PDI-SG-B360-BL1	-2.8	7634000	698636	360
	PDI-SG-B361-BL1	-35.1	7634275	698204	361
	PDI-SG-B362-BL1	-35.0	7634402	698113	362
	PDI-SG-B363-BL1	-8.6	7634737	697981	363
	PDI-SG-B364-BL1	-35.6	7634920	697663	364
	PDI-SG-B365-BL1	-31.7	7635238	697474	365
	PDI-SG-B366-BL1	-19.2	7635586	697287	366
	PDI-SG-B367-BL1	-16.5	7636013	697017	367
	PDI-SG-B368-BL1	-31.4	7636077	696906	368
	PDI-SG-B369-BL1	-23.3	7636485	696713	369
	PDI-SG-B370-BL1	-19.9	7636756	696503	370
	PDI-SG-B371-BL1	-19.4	7637073	696317	371
	PDI-SG-B372-BL1	NA	7637471	696208	372
	PDI-SG-B373-BL1	-15.7	7637569	696069	373
	PDI-SG-B374-BL1	-18.9	7638074	695716	374
	PDI-SG-B375-BL1	-30.8	7638081	695642	375
	PDI-SG-B376-BL1	-18.1	7638385	695529	376
	PDI-SG-B377-BL1	NA	7638997	695323	377
	PDI-SG-B378-BL1	NA	7639061	695347	378
	PDI-SG-B379-BL1	-16.5	7639467	694988	379
	PDI-SG-B380-BL1	-36.1	7639893	694441	380
	PDI-SG-B381-BL1	-36.6	7639953	694273	381
	PDI-SG-B382-BL1	-41.0	7640290	693666	382
	PDI-SG-B383-BL1	-40.0	7640305	693661	383
	PDI-SG-B384-BL1	-16.6	7640684	693132	384
	PDI-SG-B385-BL1	-24.2	7640800	692940	385

**Table 4. Station Location Coordinates, Target Depth, and Identification Scheme - Alternate 2 Locations**

Sample Type	Sample ID	Mudline Elevation (CRD Feet) <sup>a</sup>	Proposed Location Coordinates (NAD 1983; Intl Feet) <sup>b</sup>		Sequential Station Count
			Easting	Northing	
	PDI-SG-B386-BL1	-20.7	7641068	692640	386
	PDI-SG-B387-BL1	-28.7	7641092	692536	387
	PDI-SG-B388-BL1	-12.3	7641441	692103	388
	PDI-SG-B389-BL1	-28.6	7641709	691750	389
	PDI-SG-B390-BL1	-9.9	7641970	691532	390
	PDI-SG-B391-BL1	-31.8	7642120	691217	391
	PDI-SG-B392-BL1	-35.0	7642264	691011	392
	PDI-SG-B393-BL1	-20.1	7642588	690697	393
	PDI-SG-B394-BL1	-17.2	7642683	690604	394
	PDI-SG-B395-BL1	-29.9	7642858	690352	395
	PDI-SG-B396-BL1	-9.0	7643193	690166	396
	PDI-SG-B397-BL1	-29.5	7643400	689859	397
	PDI-SG-B398-BL1	-31.7	7643770	689619	398
	PDI-SG-B399-BL1	-13.5	7644077	689411	399
	PDI-SG-B400-BL1	-36.4	7644348	689085	400
	PDI-SG-B401-BL1	-46.7	7644447	688992	401
	PDI-SG-B402-BL1	-22.9	7644745	688763	402
	PDI-SG-B403-BL1	-20.1	7644938	688358	403
	PDI-SG-B404-BL1	-31.8	7645198	687926	404
	PDI-SG-B405-BL1	-21.8	7645387	687635	405
	PDI-SG-B406-BL1	-32.5	7645401	687558	406
	PDI-SG-B407-BL1	-63.4	7645537	687000	407
	PDI-SG-B408-BL1	-53.3	7645916	686771	408
	PDI-SG-B409-BL1	-10.3	7636745	698789	409
	PDI-SG-B410-BL1	-17.9	7636516	699206	410
	PDI-SG-B411-BL1	-19.8	7636438	699265	411
	PDI-SG-B412-BL1	NA	7635673	699247	412
	PDI-SG-B413-BL1	-24.6	7635767	699819	413
	PDI-SG-B414-BL1	-25.2	7635575	699722	414
	PDI-SG-B415-BL1	-4.2	7635272	700312	415
	PDI-SG-B416-BL1	-32.9	7634827	700112	416
	PDI-SG-B417-BL1	-31.1	7634643	700449	417
	PDI-SG-B418-BL1	-32.8	7634369	700408	418
	PDI-SG-B419-BL1	-7.8	7634465	701068	419
	PDI-SG-B420-BL1	NA	7634059	701261	420
	PDI-SG-B421-BL1	-32.9	7633509	701342	421
	PDI-SG-B422-BL1	-33.5	7633413	701362	422
	PDI-SG-B423-BL1	-24.7	7632691	701777	423
	PDI-SG-B424-BL1	NA	7632934	701251	424
	PDI-SG-B425-BL1	-32.4	7632459	701522	425
	PDI-SG-B426-BL1	-40.0	7632028	701164	426
	PDI-SG-B427-BL1	-38.7	7632337	700386	427
	PDI-SG-B428-BL1	-56.5	7631718	700785	428

**Notes:**

All surface sediment samples have a target depth of 30 cm.

Conversion From CRD to NAVD88: Elevation(CRD)+5.38=NAVD88

**Footnotes:**

a) Vertical Datum: CRD (Columbia River Datum; Feet); based on 2009 NOAA bathymetry

b) Horizontal Projection: NAD 1983 Oregon State Plane North (Intl Feet)

**Acronyms:**

cm = centimeter; CRD = Columbia River Datum; ID = identification number; NA = not available; NAD = North American Datum; NAVD88 = North American Vertical Datum of 1988; NOAA = National Oceanic and Atmospheric Administration

**Table 5. Field Quality Control Sample Requirements**

QA/QC Sample Type	Frequency
Temperature Blanks	1 per cooler
Blind Field Duplicates	5 percent
Field Equipment Rinsate Blanks	5 percent or 1 per week per equipment
Field Trip Blanks (VOC analysis only)	1 per cooler

**Acronyms:**

QA/QC = quality assurance/quality control; VOC = volatile organic compound

**Table 6. Summary of Estimated Field Quality Control Samples**

Surface Sediment Sample Type	Number of Project Samples	Estimated # of Field Weeks	Blind Field Duplicates	Field Equipment Rinsate Blanks
Stratified Random Site Samples	428	8.6	22	22
SMA Targeted Site Samples	178	3.6	9	9
Co-located Grabs at In-water Core Stations	60	1.2	3	3
Downtown/Upriver Reaches	60	1.2	3	3
<b>Total Count</b>	<b>726</b>	<b>14.5</b>	<b>37</b>	<b>37</b>

**Notes:**

Estimated number of field weeks for one vessel; two vessels are planned to be in the field.

**Acronyms:**

# = number; SMA = sediment management area

**Table 7. Analyte List**

Media	Location Count	Analyte List	
		Parameter	Method
Surface Sediment Stratified Random	428 - within Site; 60 - D/U Reach	Aldrin	8081B
		Arsenic	6020B
		BEHP	8270C
		Cadmium	6020B
		Chlordanes	8081B
		Copper	6020B
		DDx	8081B
		DDD	8081B
		DDE	8081B
		DDT	8081B
		Dieldrin	8081B
		Lindane	8081B
		Lead	6020B
		Mercury	7471A
		PCB congeners	1668
		PAHs	8270D SIM
		cPAHs (BaP eq)	8270D SIM
		1,2,3,4,7,8-HxCDF	1613B
		1,2,3,7,8-PeCDD	1613B
		2,3,4,7,8-PeCDF	1613B
		2,3,7,8-TCDF	1613B
		2,3,7,8-TCDD	1613B
		PCDD/Fs	1613B
		TPH-Diesel	8015B-DRO
		Tributyltin	Organotin
		Zinc	6020B
		TOC	Plumb 1981/ EPA 9060
		Grain Size	ASTM D422
Additional Surface Sediment - SMA	178 - within Site	DDx	8081B
		PCB congeners	1668
		PAHs	8270D SIM
		PCDD/Fs	1613B
		TOC	Plumb 1981/ EPA 9060
		Grain Size	ASTM D422
Additional Surface Sediment - In- water Core Location Grab	60 - within Site	DDx	8081B
		PCB congeners	1668
		PAHs	8270D SIM
		PCDD/Fs	1613B
		TOC	Plumb 1981/ EPA 9060
		Grain Size	ASTM D422

**Abbreviations:**

BEHP = Bis(2-ethylhexyl) phthalate; DDx = sum of dichlorodiphenyltrichloroethane and its derivatives; DRO = diesel range organics; D/U = Downtown/Upriver Reach; EPA = US Environmental Protection Agency; PAH = polycyclic aromatic hydrocarbon; PCB = polychlorinated biphenyls; PCDD/Fs = polychlorinated dibenzo-p-dioxins and furans; PSEP = Puget Sound Estuary Protocol; SIM = selected ion monitoring; TOC = total organic carbon

**Table 8. Sample Containers, Preservation, Holding Times, and Sample Volume**

Sediment Analysis	Container		Preservation	Holding Time	Minimum Sample Size (wet weight grams)
	Type	Size			
PCB Congeners	WMG	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	1 year 1 year	100
PCDD/Fs	WMG	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	1 year 1 year <sup>a</sup>	100
Pesticides	WMG	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	14 days 1 year	100
PAHs	WMG	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	14 days 1 year	100
BEHP	WMG	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	14 days 1 year	100
Metals	G or P	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	6 months 2 years	50
Mercury	WMG	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	28 days 28 days	50
Tributyltin	WMG	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	14 days 1 year	100
Grain size	G or P	16 oz	Refrigerate, 4 ± 2°C	6 months	100 to 150
Total organic carbon	WMG	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	14 days 1 year	25
Total solids	G or P	8 oz	Refrigerate, 6°C Deep Frozen (-20°C)	14 days 6 months	50
TPH Diesel	G	8 oz	Refrigerate, 4°C Deep Frozen (-20°C)	14 days, 40 days	50

**Notes:**

Refrigerate preservation times consistent with PSEP protocols for Washington State.

Frozen preservation times provided from PSEP 1996.

Method detection limits presented in the project QAPP.

**Footnotes:**

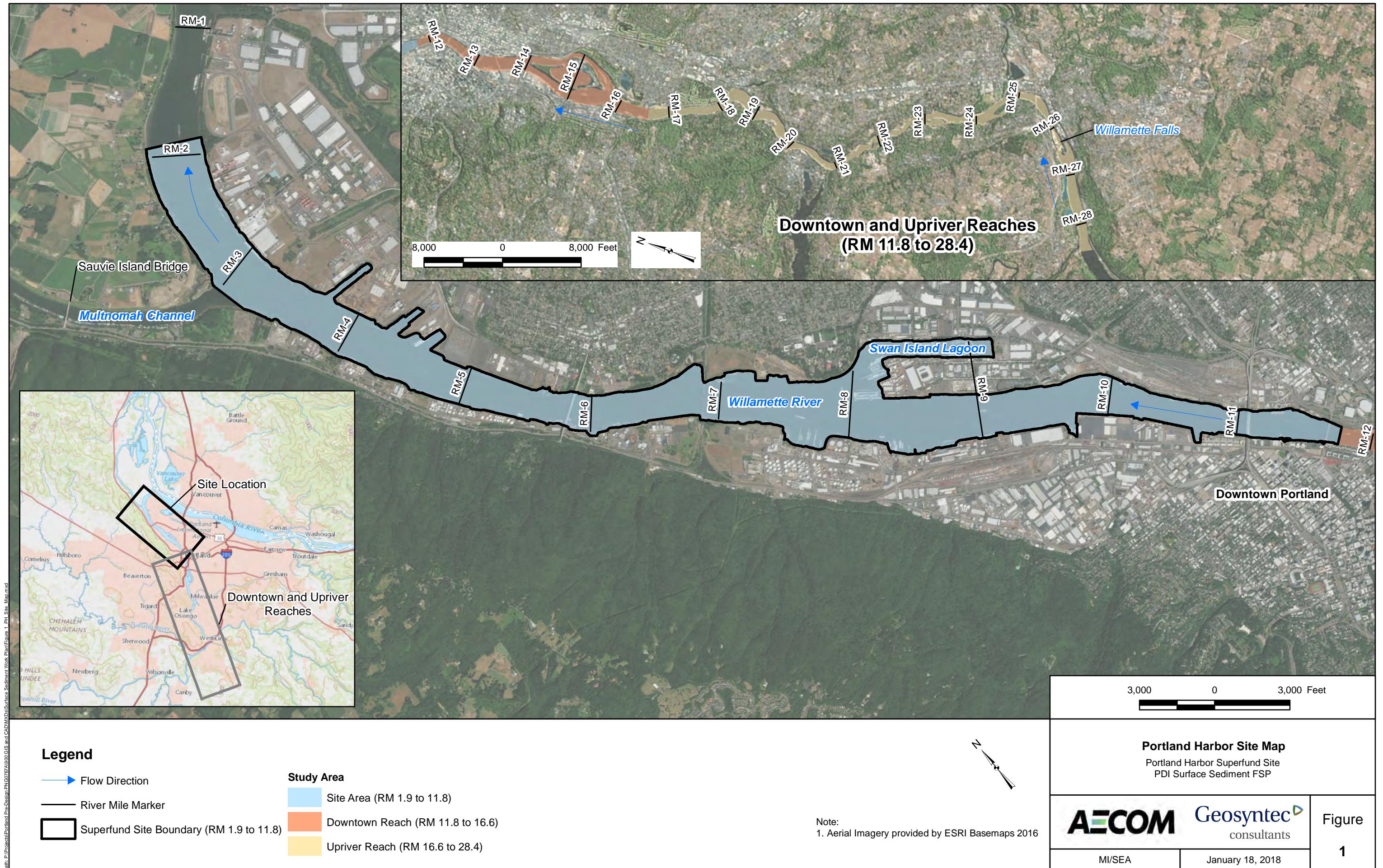
a) stored in darkness

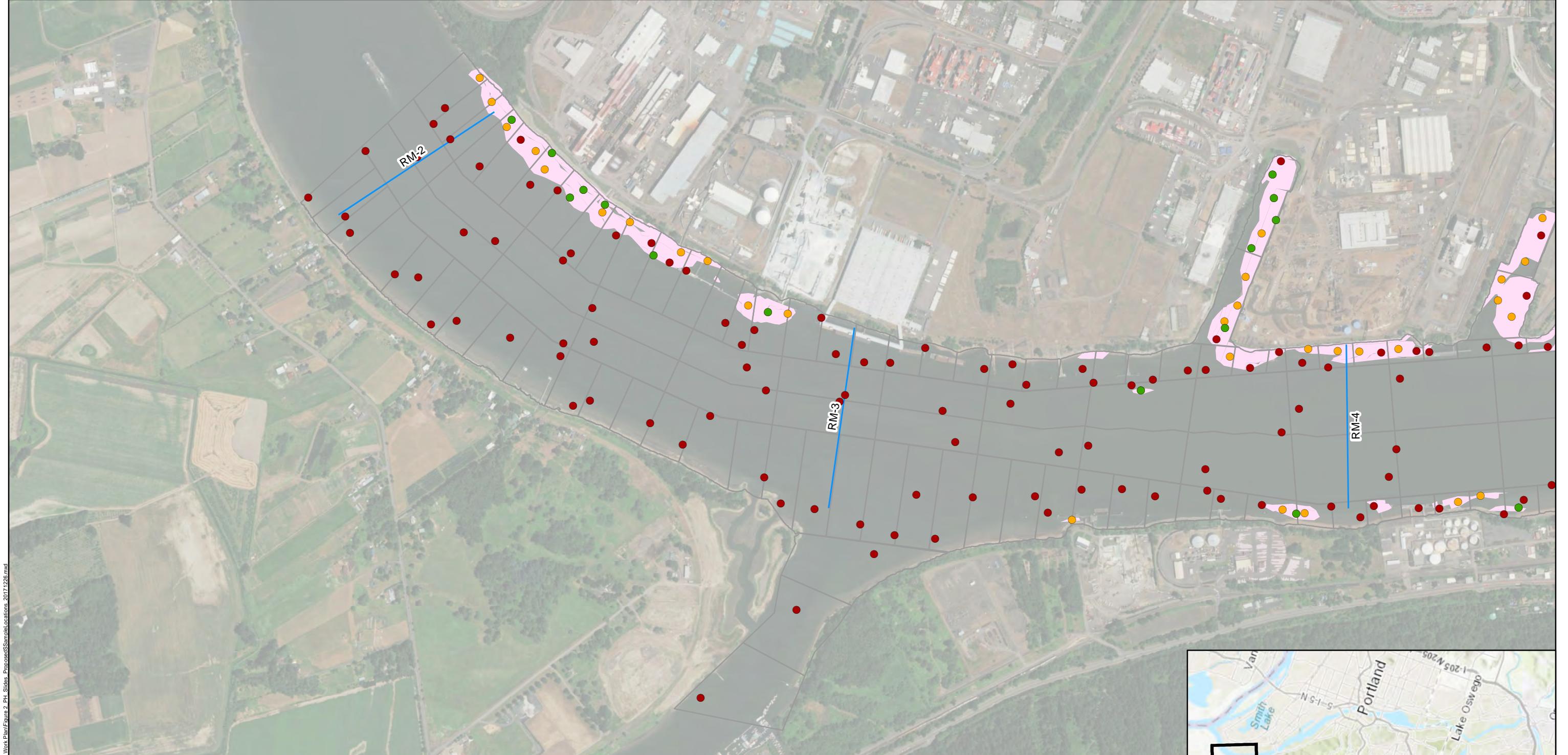
**Acronyms:**

BEHP = Bis(2-ethylhexyl) phthalate; G = glass; oz. = ounce; P = plastic; PCB = polychlorinated biphenyls; PCDD/Fs = polychlorinated dibenzo-p-dioxins and furans; PSEP = Puget Sound Estuary Protocol; QAPP = Quality Assurance Project Plan; SVOC = semi-volatile organic compound; TPH = total petroleum hydrocarbons; VOC = volatile organic compound; WMG = wide mouth glass

## **FIGURES**

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### Legend

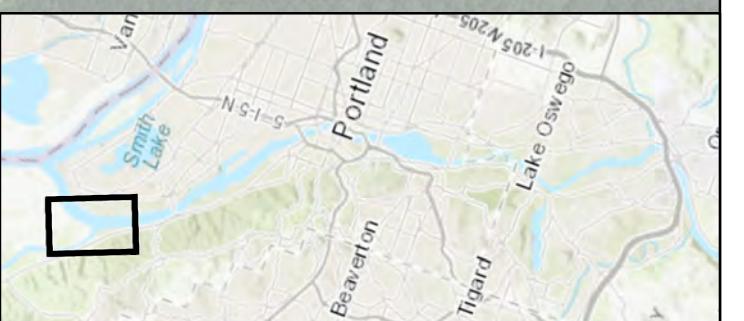
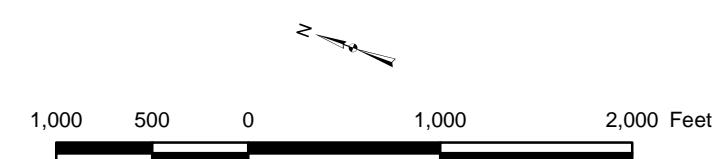
- Stratified Random Samples (n = 428)
- Randomized Sample Grid Cells
- Additional SMA Samples (n = 178)
- Capped Area (Existing)
- Surface Grab at Co-located Core Location (n = 60)
- Alternative F Mod SMA Footprint

River Mile Marker

Note: The location of SMA surface sediment grab samples may need to be revisited based on redistribution of cores to optimize coverage in the SMAs.

### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. 5 grabs were removed from the RM 11E vicinity and will be redistributed in the site (TBD).
4. n - sample count, RM - river mile. SMA - Sediment Management Area.



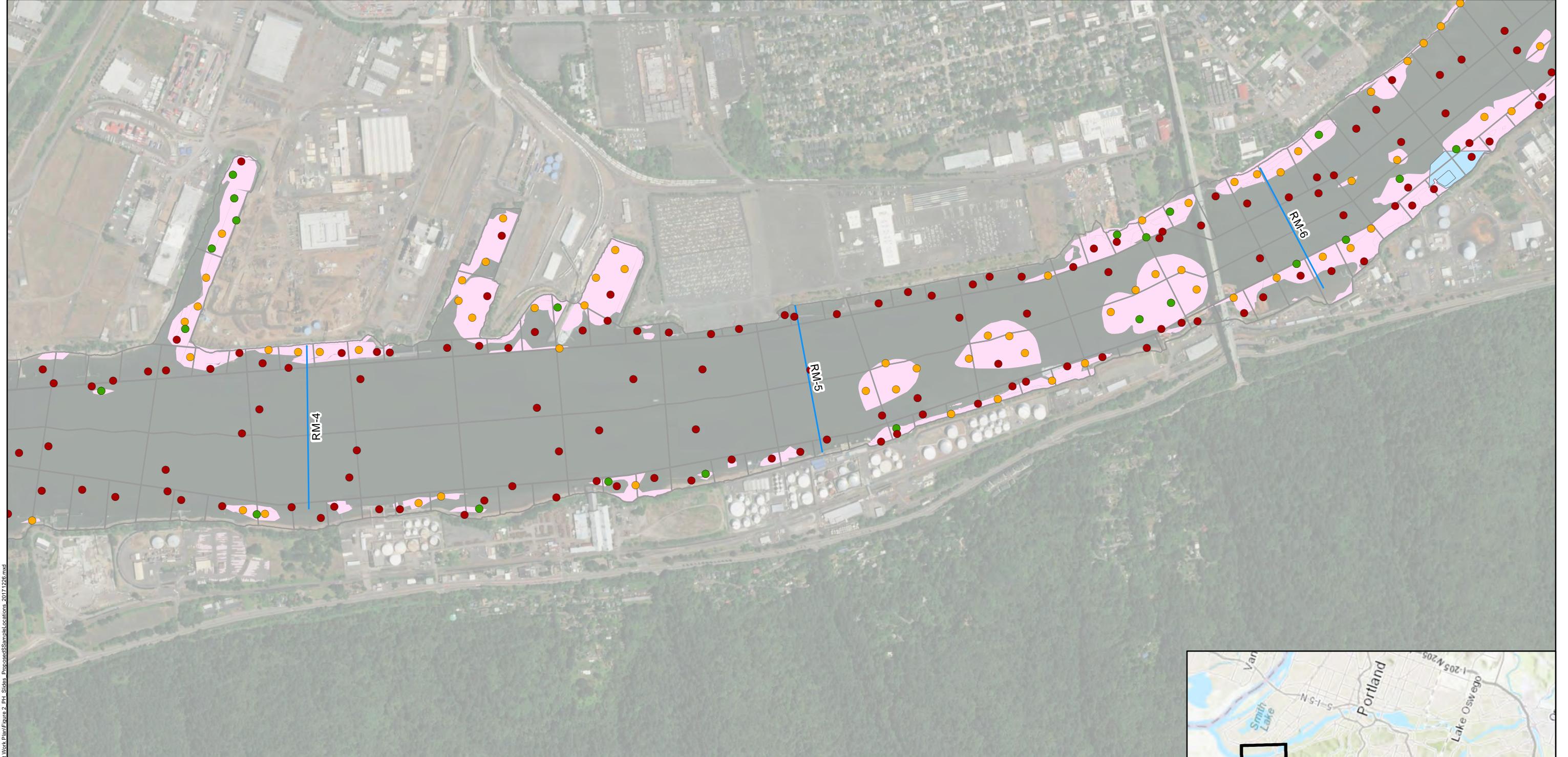
**Proposed Surface Sediment Sampling Locations - RM 1.9 to 4**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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consultants

Figure

2a



Path: P:\Projects\Portland\Pre-Design\PN057\DATA\00\_GIS and CAD\UXD\Surface Sediment Work Plan\Figure 2\_Pt\_Sites\_ProposedSurfaceSedimentLocations\_20171226.mxd

### Legend

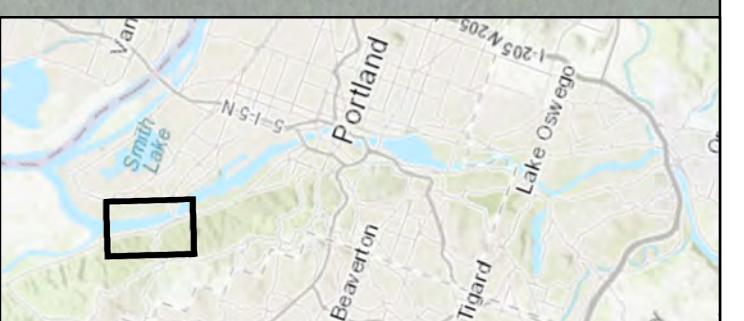
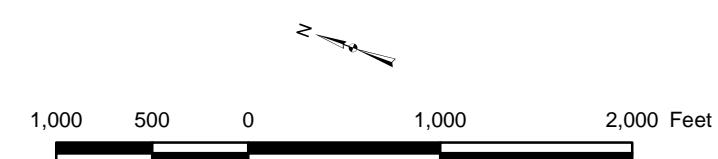
- Stratified Random Samples (n = 428)
- Additional SMA Samples (n = 178)
- Surface Grab at Co-located Core Location (n = 60)
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

River Mile Marker

Note: The location of SMA surface sediment grab samples may need to be revisited based on redistribution of cores to optimize coverage in the SMAs.

### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. 5 grabs were removed from the RM 11E vicinity and will be redistributed in the site (TBD).
4. n - sample count, RM - river mile. SMA - Sediment Management Area.



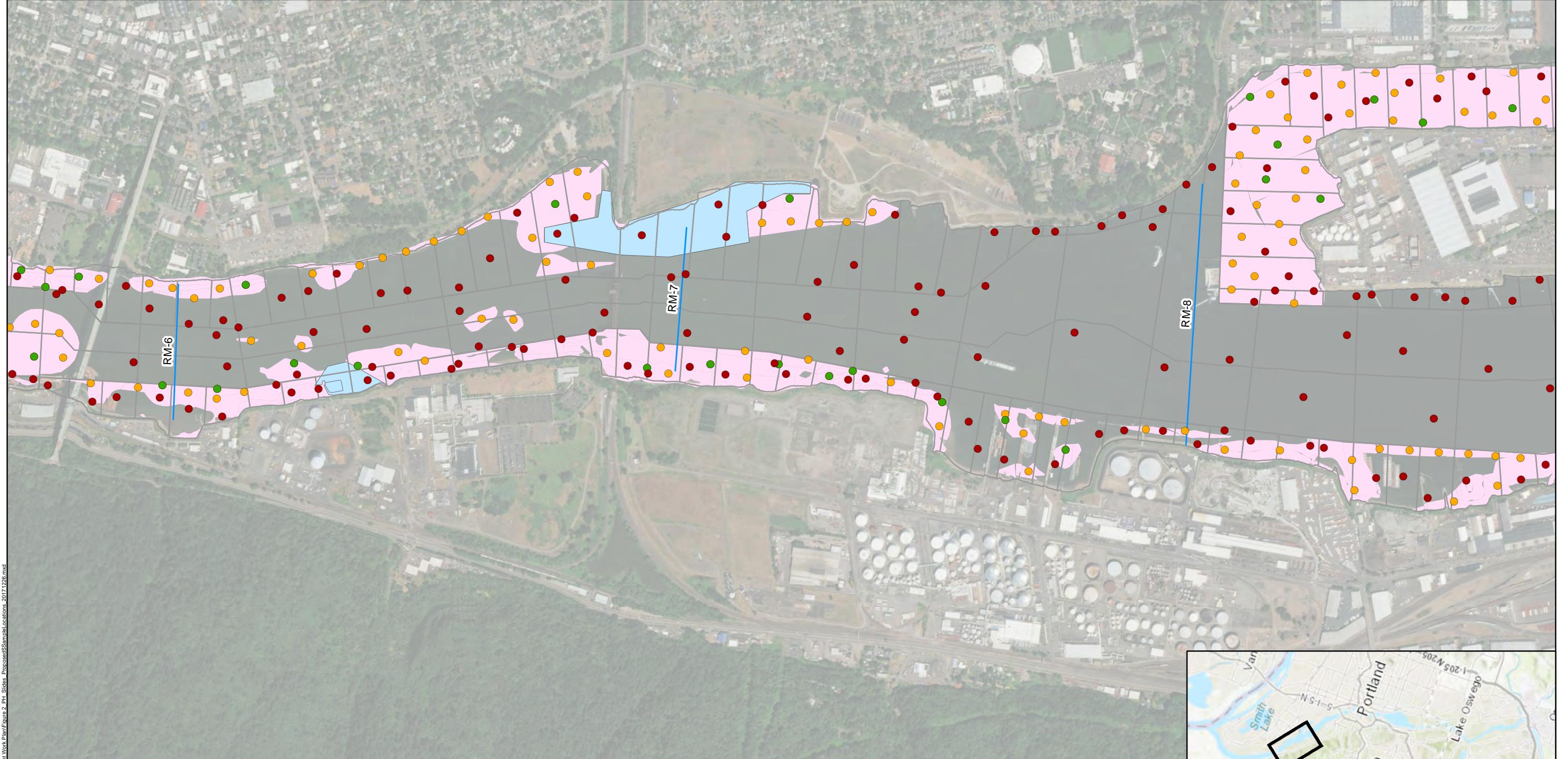
**Proposed Surface Sediment Sampling Locations - RM 4 to 6**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure

**2b**



Path: P:\Projects\Portland\Pre-Design\PN057\DATA\GIS and CAD\UXD\Surface Sediment Work Plan\Figure 2\_Pt\_Sites\_ProposedSampleLocations\_20171226.mxd

### Legend

- Stratified Random Samples (n = 428)
- Randomized Sample Grid Cells
- Additional SMA Samples (n = 178)
- Capped Area (Existing)
- Surface Grab at Co-located Core Location (n = 60)
- Alternative F Mod SMA Footprint

Note: The location of SMA surface sediment grab samples may need to be revisited based on redistribution of cores to optimize coverage in the SMAs.

### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. 5 grabs were removed from the RM 11E vicinity and will be redistributed in the site (TBD).
4. n - sample count, RM - river mile. SMA - Sediment Management Area.

1,000 500 0 1,000 2,000 Feet



**Proposed Surface Sediment Sampling Locations - RM 6 to 8**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure

2c



### Legend

- Stratified Random Samples (n = 428)
- Additional SMA Samples (n = 178)
- Surface Grab at Co-located Core Location (n = 60)
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

River Mile Marker

Note: The location of SMA surface sediment grab samples may need to be revisited based on redistribution of cores to optimize coverage in the SMAs.

- Notes:
1. Aerial Imagery provided by ESRI Basemaps 2017.
  2. Surface sediment samples are defined as the 0-30 cm depth.
  3. 5 grabs were removed from the RM 11E vicinity and will be redistributed in the site (TBD).
  4. n - sample count, RM - river mile. SMA - Sediment Management Area.

1,000 500 0 1,000 2,000 Feet



**Proposed Surface Sediment Sampling Locations - RM 8 to 10**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure  
**2d**



### Legend

- Stratified Random Samples (n = 428)
- Randomized Sample Grid Cells
- Additional SMA Samples (n = 178)
- Capped Area (Existing)
- Surface Grab at Co-located Core Location (n = 60)
- Alternative F Mod SMA Footprint
- River Mile Marker

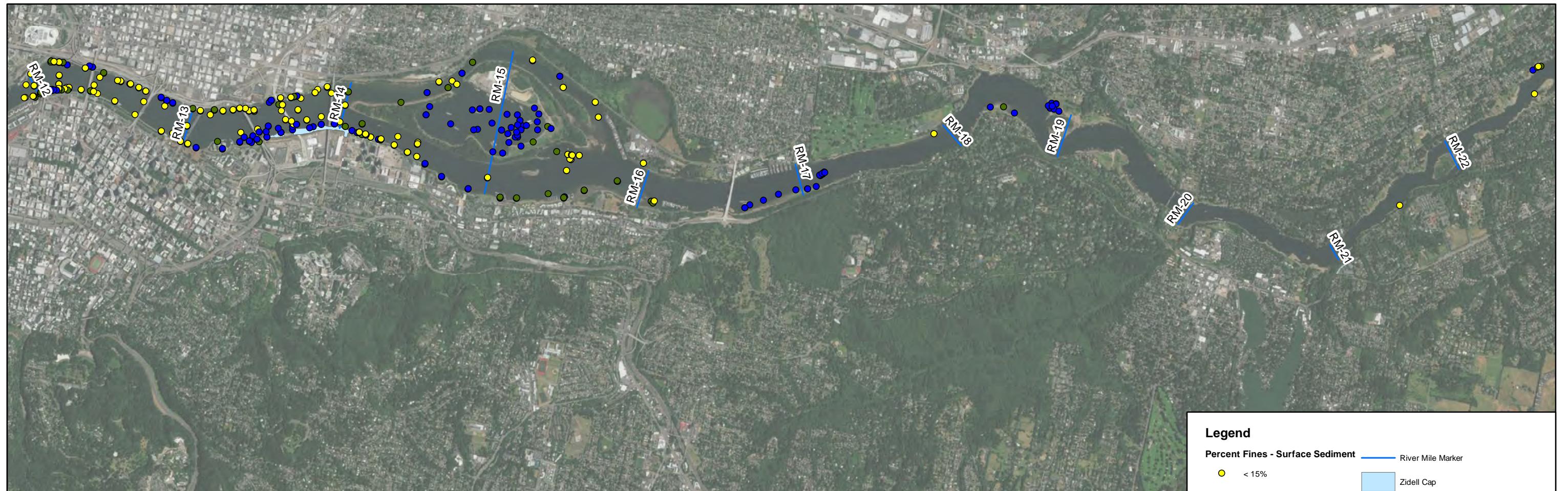
Note: The location of SMA surface sediment grab samples may need to be revisited based on redistribution of cores to optimize coverage in the SMAs.

- Notes:
1. Aerial Imagery provided by ESRI Basemaps 2017.
  2. Surface sediment samples are defined as the 0-30 cm depth.
  3. 5 grabs were removed from the RM 11E vicinity and will be redistributed in the site (TBD).
  4. n - sample count, RM - river mile. SMA - Sediment Management Area.

1,000 500 0 1,000 2,000 Feet



**Proposed Surface Sediment Sampling Locations - RM 10 to 11.8**  
Portland Harbor Superfund Site  
PDI Surface Sediment FSP

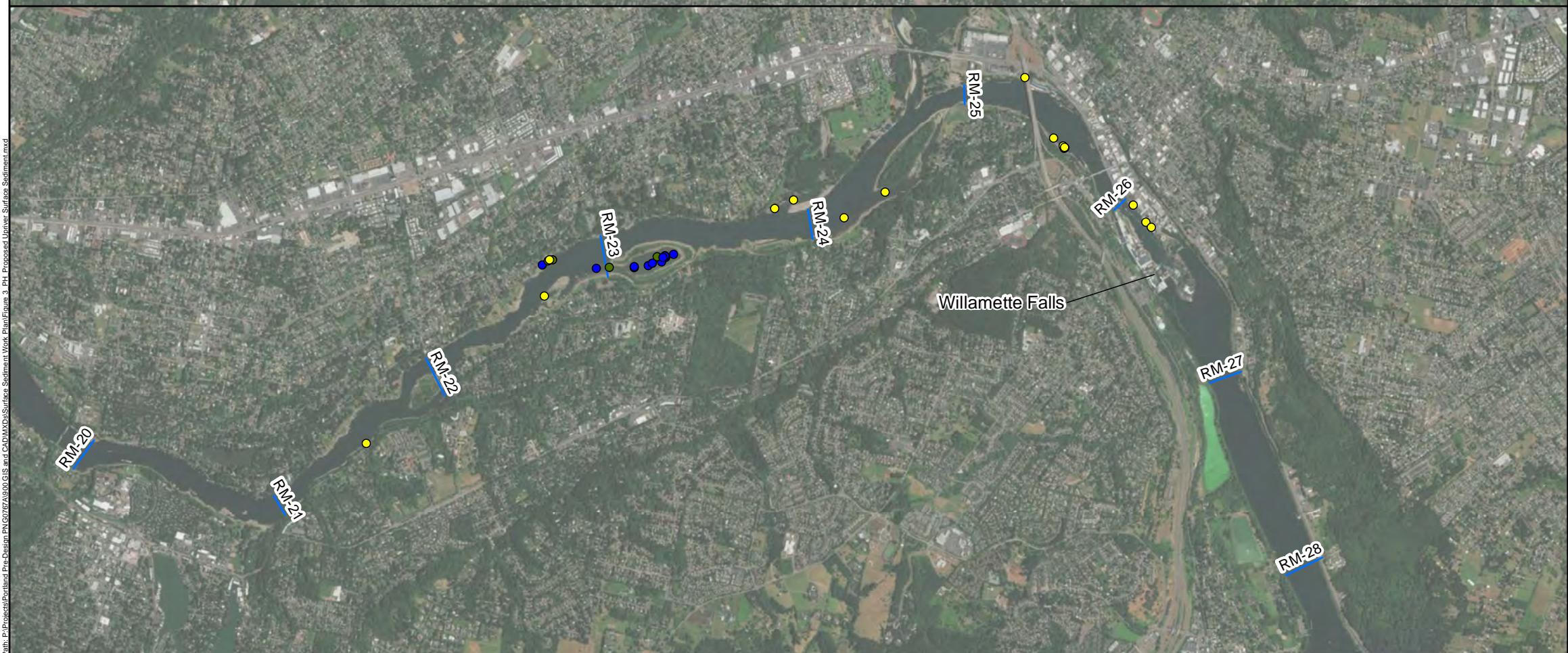


#### Legend

Percent Fines - Surface Sediment	River Mile Marker
Yellow dot	< 15%
Green dot	15% - 30%
Blue dot	> 30%

#### Notes:

1. Percent Fines defined as the percentage (mass) of material that passed through a 0.06 mm sieve.
2. Aerial Imagery provided by ESRI Basemaps 2017
3. RM = River Mile
4. RI samples obtained from EPA, 2016. *Portland Harbor RI/FS, Final Remedial Investigation Report, Portland Oregon. United States Environmental Protection Agency Region 10, Seattle, Washington.* 8 February.
5. Post RI samples obtained from GSI Water Solutions, Inc. (GSI), and Hart Crowser, Inc., 2010. *Field and Data Report, Downtown Portland Sediment Characterization Phase II, Willamette River, Portland, Oregon* and Kleinfelder, 2015. *Sediment Sampling Data Report, Portland Harbor, Portland, Oregon. Prepared for de maximis Inc. 1 June. Prepared for Oregon Department of Environmental Quality.*
6. Zidell Cap is approximate only; Figure 5-4 Sediment Alternative 4 (ZRZ Realty Company), Dated 2004-11-01, Revised 2004-11-29.

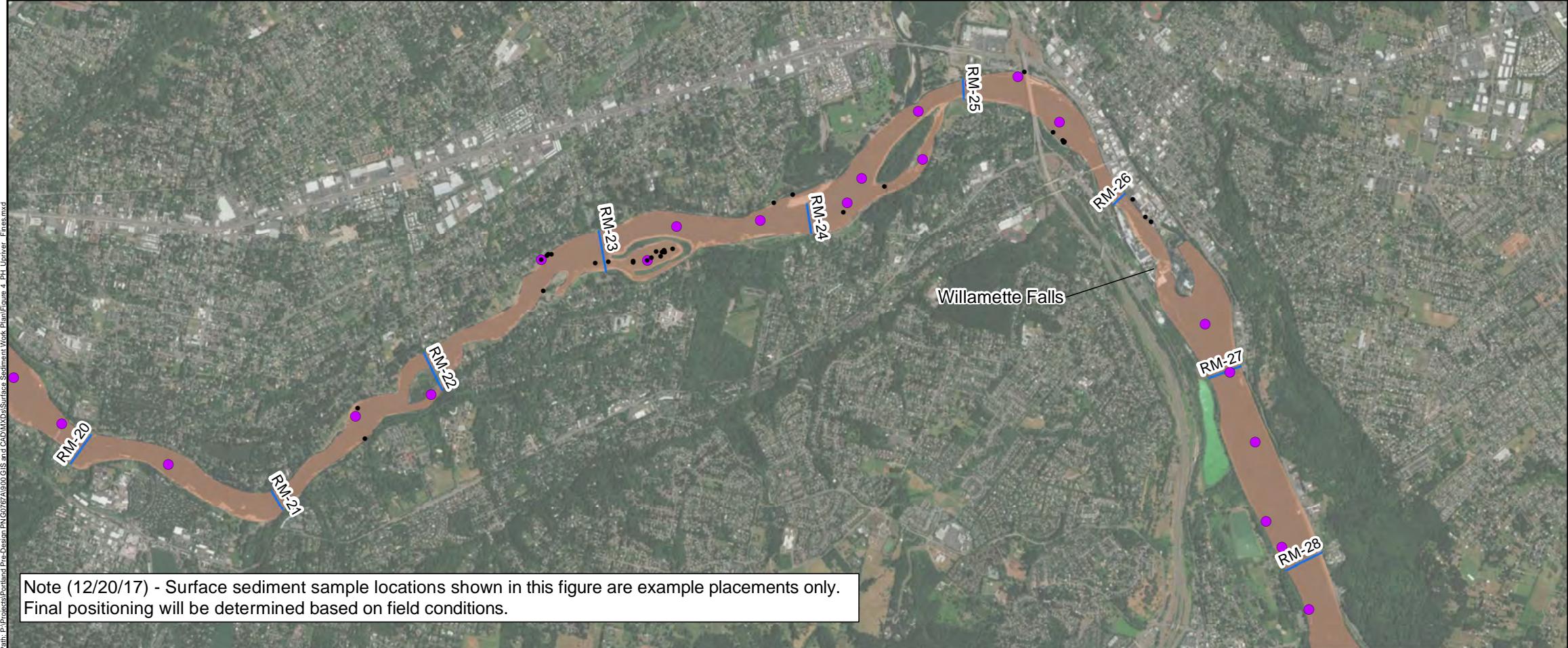


Upriver Percent Fines Distribution  
RM 11.8 to 26.4

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PDI Surface Sediment FSP

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Figure  
**3**



**Notes:**

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. RM = River Mile.
3. Upriver sampling area consists of the Downtown Reach (RM 11.8 to 16.6) and Upstream Reach (RM 16.6 to 28.4) (EPA, 2017).
4. RI samples obtained from EPA, 2016. *Portland Harbor RI/FS, Final Remedial Investigation Report, Portland Oregon. United States Environmental Protection Agency Region 10, Seattle, Washington.* 8 February.
5. Post RI samples obtained from GSI Water Solutions, Inc. (GSI), and Hart Crowser, Inc., 2010. *Field and Data Report, Downtown Portland Sediment Characterization Phase II, Willamette River, Portland, Oregon* and Kleinfelder, 2015. *Sediment Sampling Data Report, Portland Harbor, Portland, Oregon. Prepared for de maximis Inc.* 1 June. Prepared for Oregon Department of Environmental Quality.
6. Zidell Cap is approximate only; Figure 5-4 Sediment Alternative 4 (ZRZ Realty Company), Dated 2004-11-01, Revised 2004-11-29
7. Sediment grab locations to be confirmed in the field and placed in areas of fine-grained material
8. The 60 proposed grab locations were divided (30 ea) between the Downtown and the Upriver reaches.





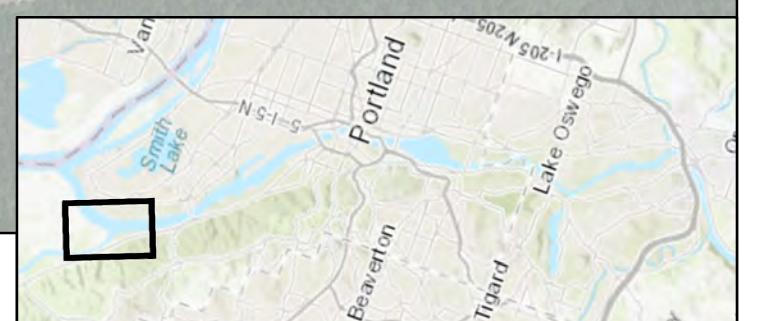
#### Legend

- Stratified Random Samples (n = 428)      — River Mile Marker
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

#### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. n - sample count, RM - river mile, SMA - Sediment Management Area.

1,000    500    0    1,000    2,000 Feet



**Proposed Stratified Random Site Sample Locations  
(Alternate 1)  
RM 1.9 to 4**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

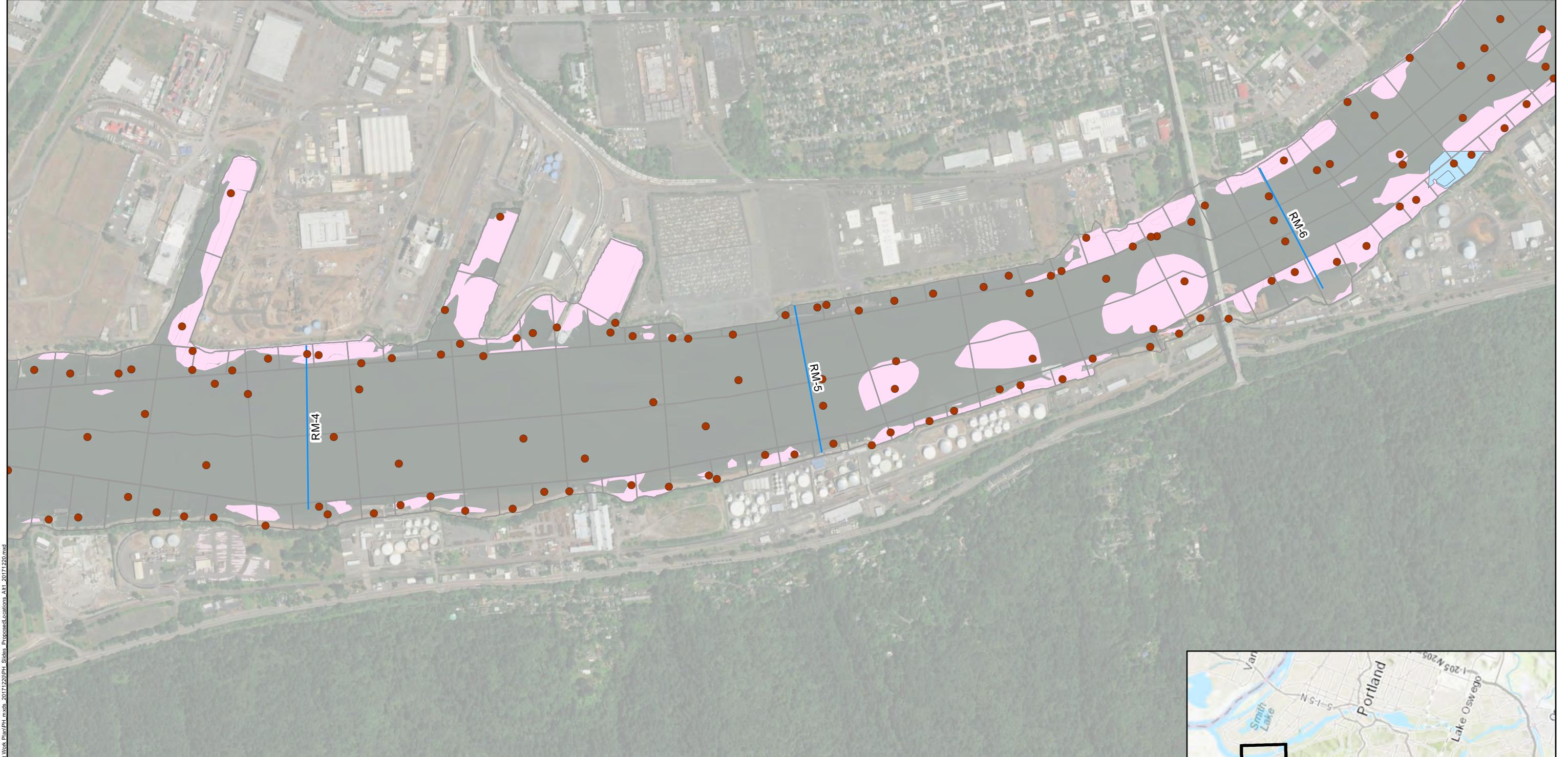
**AECOM Geosyntec**  
consultants

Figure

5a

MI/SEA

January 18, 2018



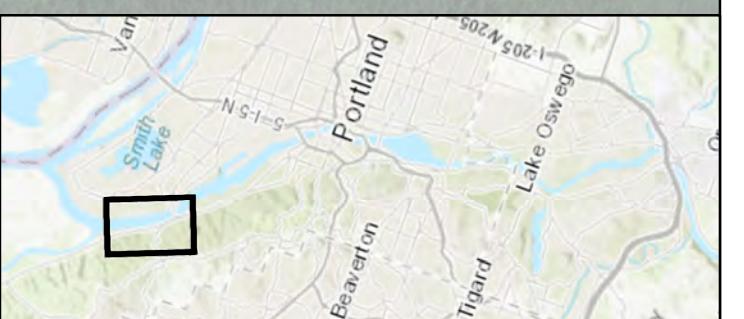
#### Legend

- Stratified Random Samples (n = 428) — River Mile Marker
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

#### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. n - sample count, RM - river mile, SMA - Sediment Management Area.

1,000 500 0 1,000 2,000 Feet



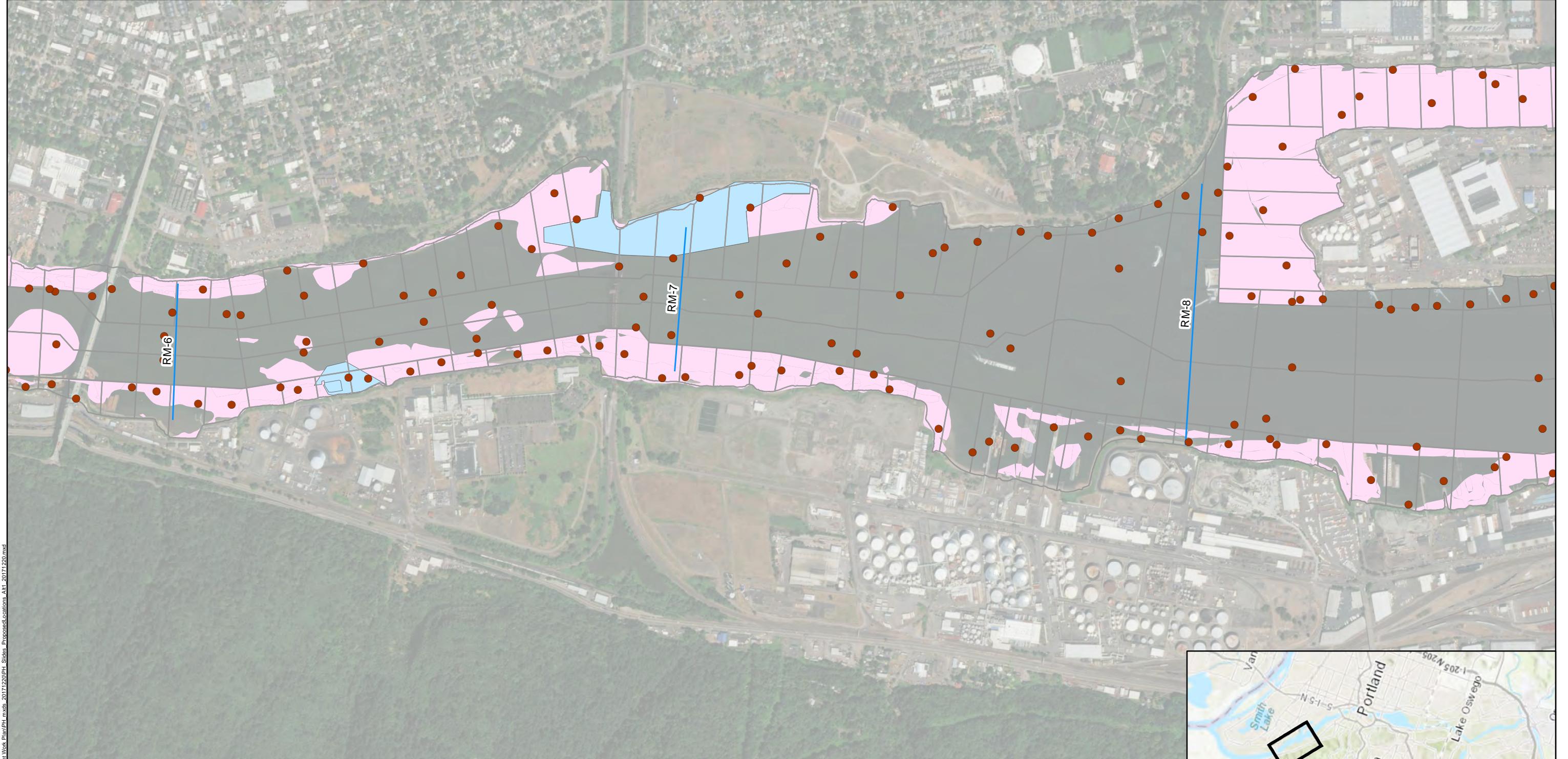
**Proposed Stratified Random Site Sample Locations  
(Alternate 1)  
RM 4 to 6**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure

5b

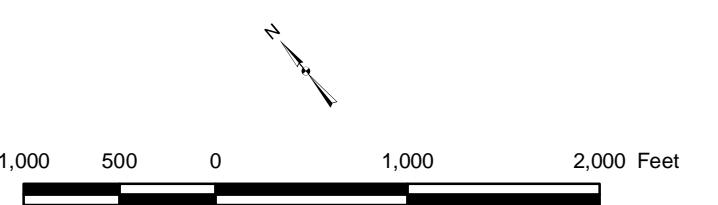


#### Legend

- |   |                     |
|---|---------------------|
| ● Stratified Random Samples (n = 428)         | — River Mile Marker |
| [Light Gray Box] Randomized Sample Grid Cells |                     |
| [Light Blue Box] Capped Area (Existing)       |                     |
| [Pink Box] Alternative F Mod SMA Footprint    |                     |

#### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. n - sample count, RM - river mile, SMA - Sediment Management Area.



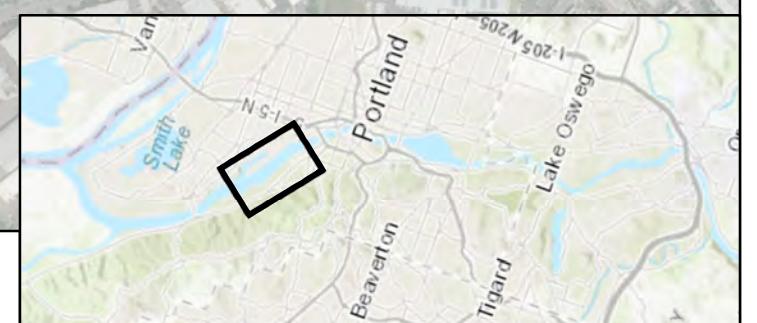
**Proposed Stratified Random Site Sample Locations  
(Alternate 1)  
RM 6 to 8**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure

5c



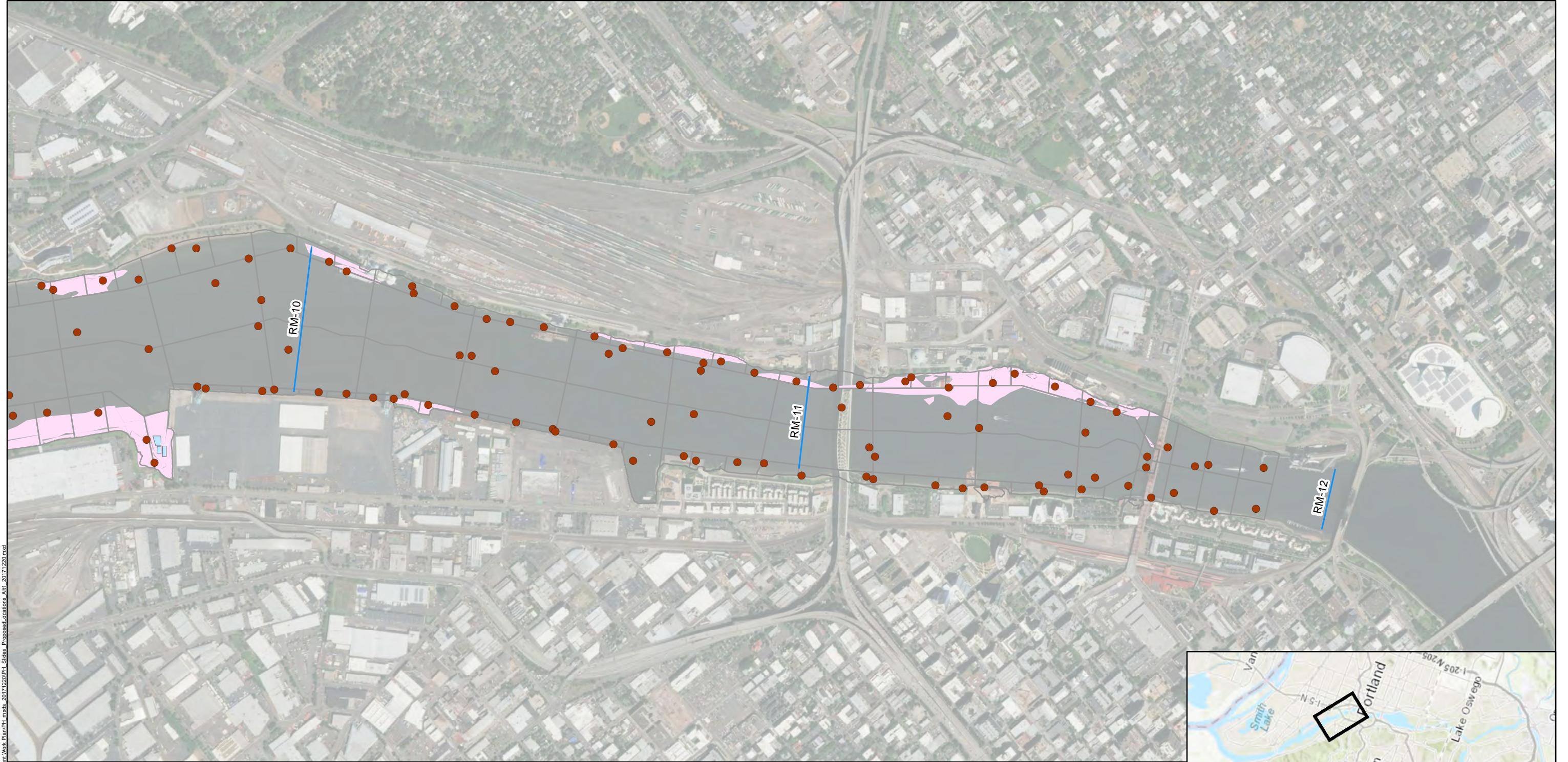
**Proposed Stratified Random Site Sample Locations  
(Alternate 1)  
RM 8 to 10**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

**AECOM Geosyntec**  
consultants

Figure

5d

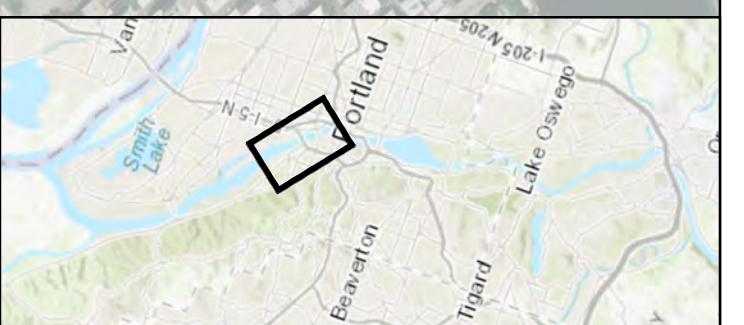
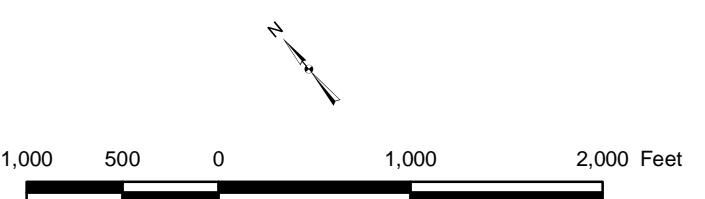


#### Legend

- Stratified Random Samples (n = 428)
- River Mile Marker
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

#### Notes:

- Aerial Imagery provided by ESRI Basemaps 2017.
- Surface sediment samples are defined as the 0-30 cm depth.
- n - sample count, RM - river mile, SMA - Sediment Management Area.



**Proposed Stratified Random Site Sample Locations  
(Alternate 1)  
RM 10 to 11.8**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure

5e

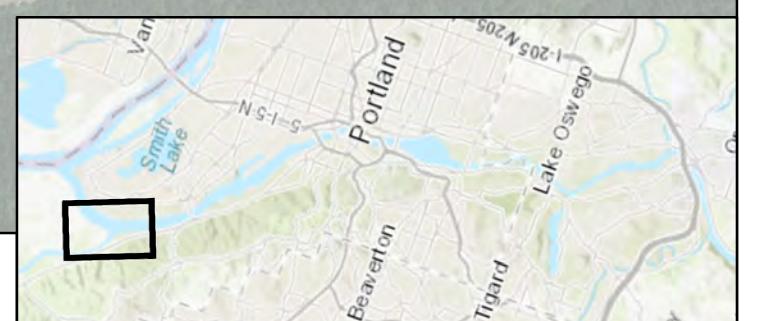
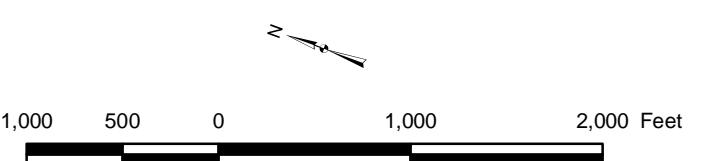


#### Legend

- Stratified Random Samples (n = 428) — River Mile Marker
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

#### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. n - sample count, RM - river mile, SMA - Sediment Management Area.



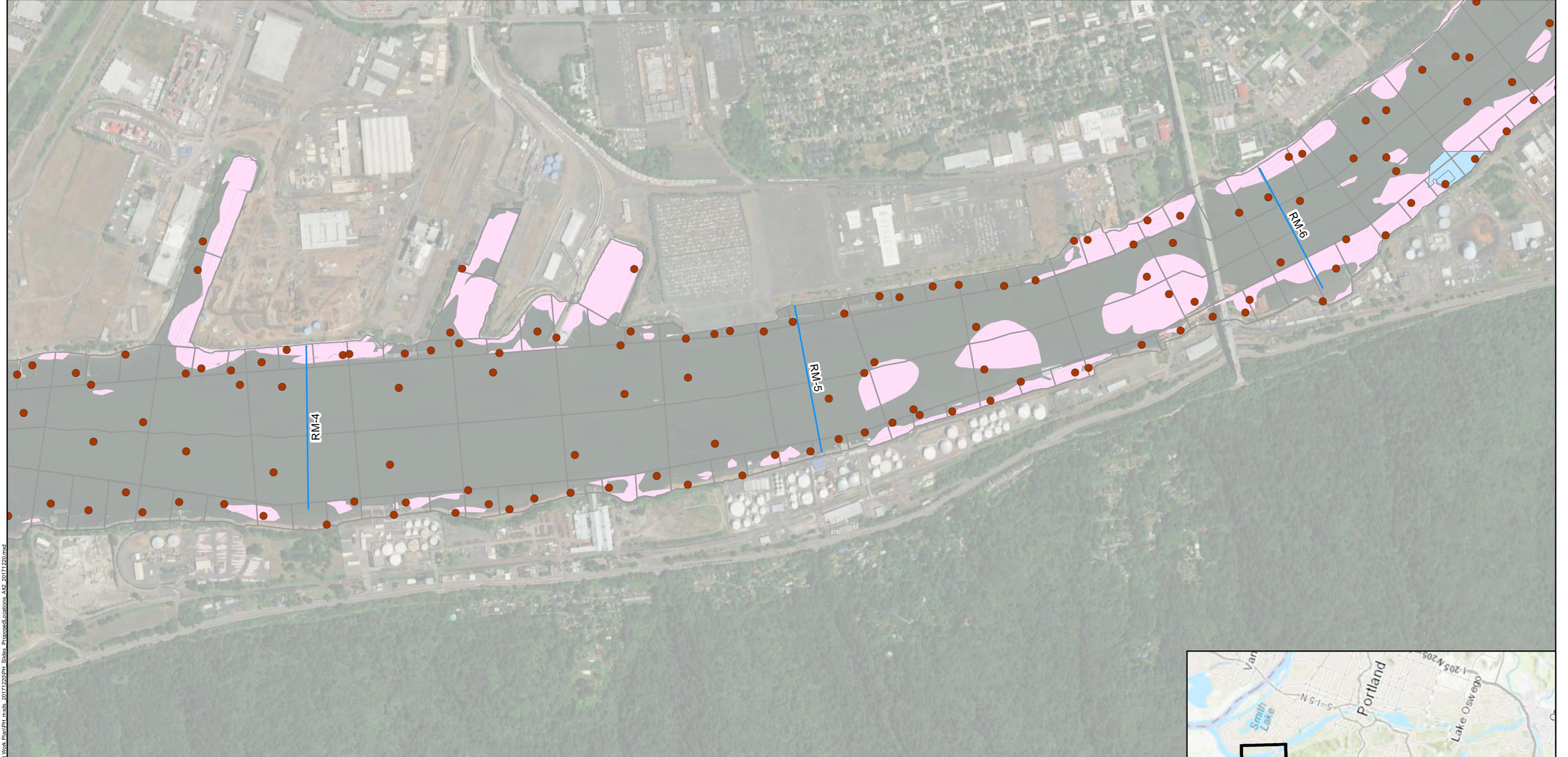
**Proposed Stratified Random Site Sample Locations  
(Alternate 2)  
RM 1.9 to 4**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure

6a



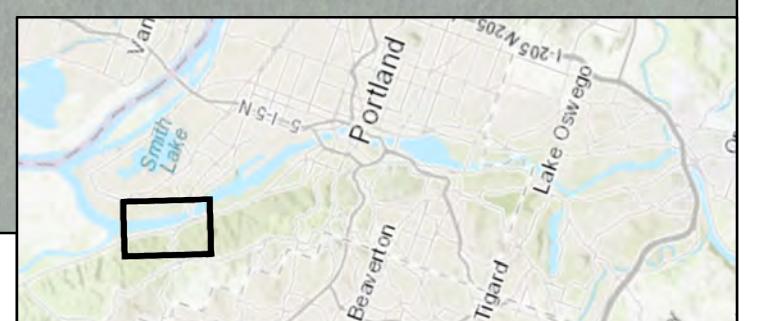
#### Legend

- Stratified Random Samples (n = 428)
- River Mile Marker
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

#### Notes:

- Aerial Imagery provided by ESRI Basemaps 2017.
- Surface sediment samples are defined as the 0-30 cm depth.
- n - sample count, RM - river mile, SMA - Sediment Management Area.

1,000 500 0 1,000 2,000 Feet



**Proposed Stratified Random Site Sample Locations  
(Alternate 2)  
RM 4 to 6**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure

6b

MI/SEA

January 18, 2018

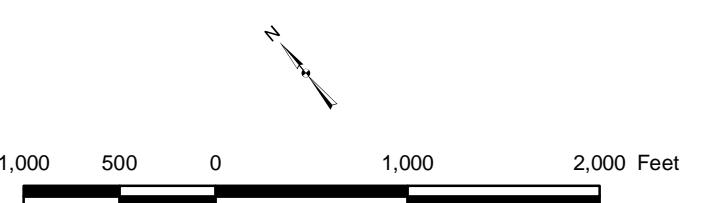


#### Legend

- Stratified Random Samples (n = 428)
- River Mile Marker
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

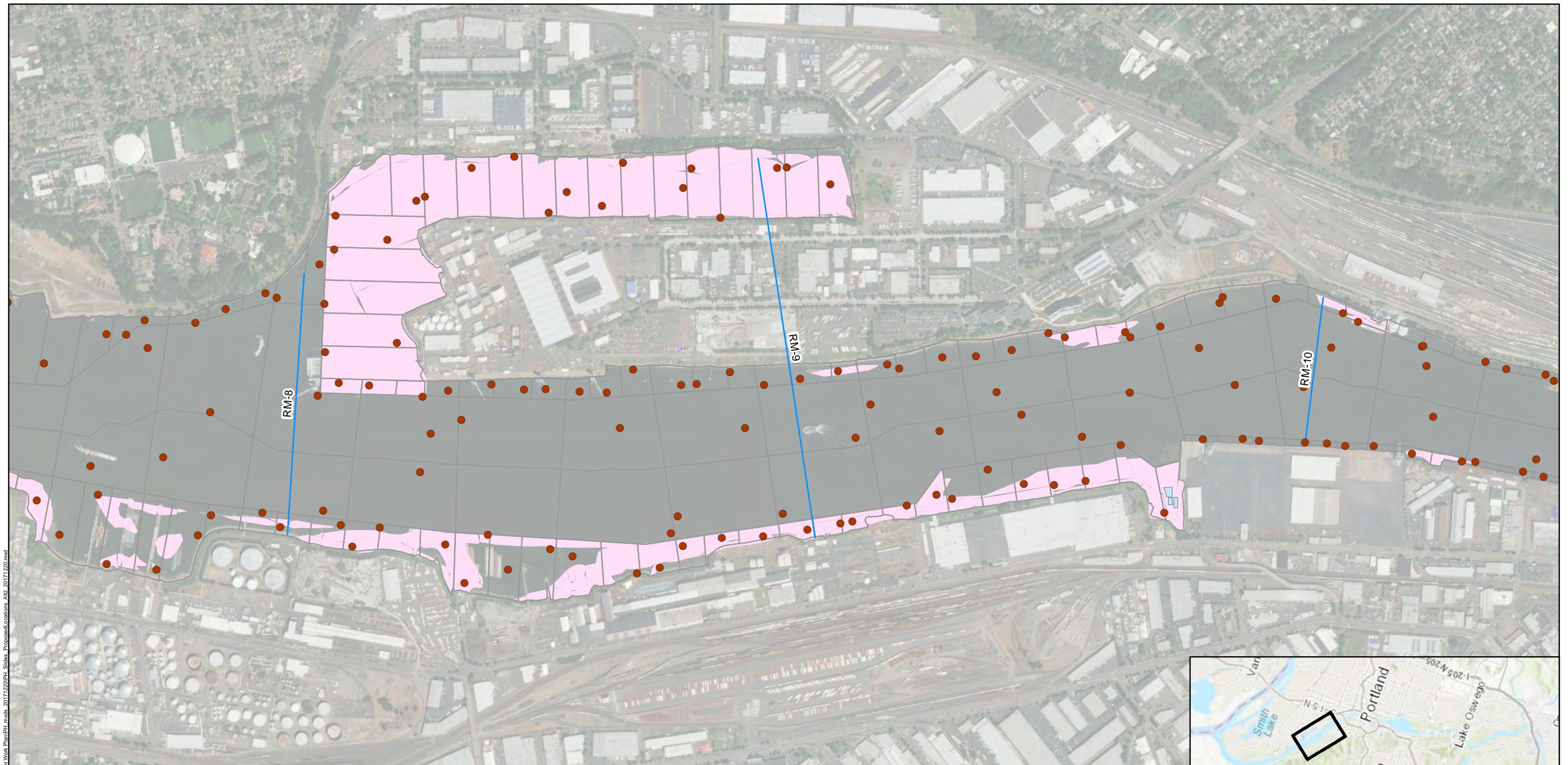
Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. n - sample count, RM - river mile, SMA - Sediment Management Area.



**Proposed Stratified Random Site Sample Locations  
(Alternate 2)  
RM 6 to 8**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

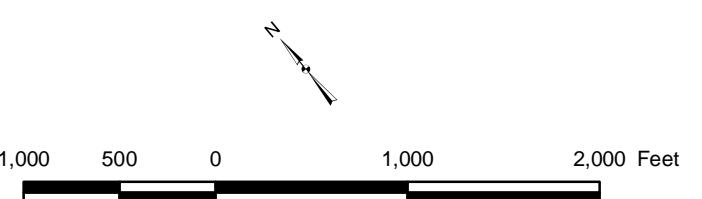


#### Legend

- Stratified Random Samples (n = 428) — River Mile Marker
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

#### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. n - sample count, RM - river mile, SMA - Sediment Management Area.



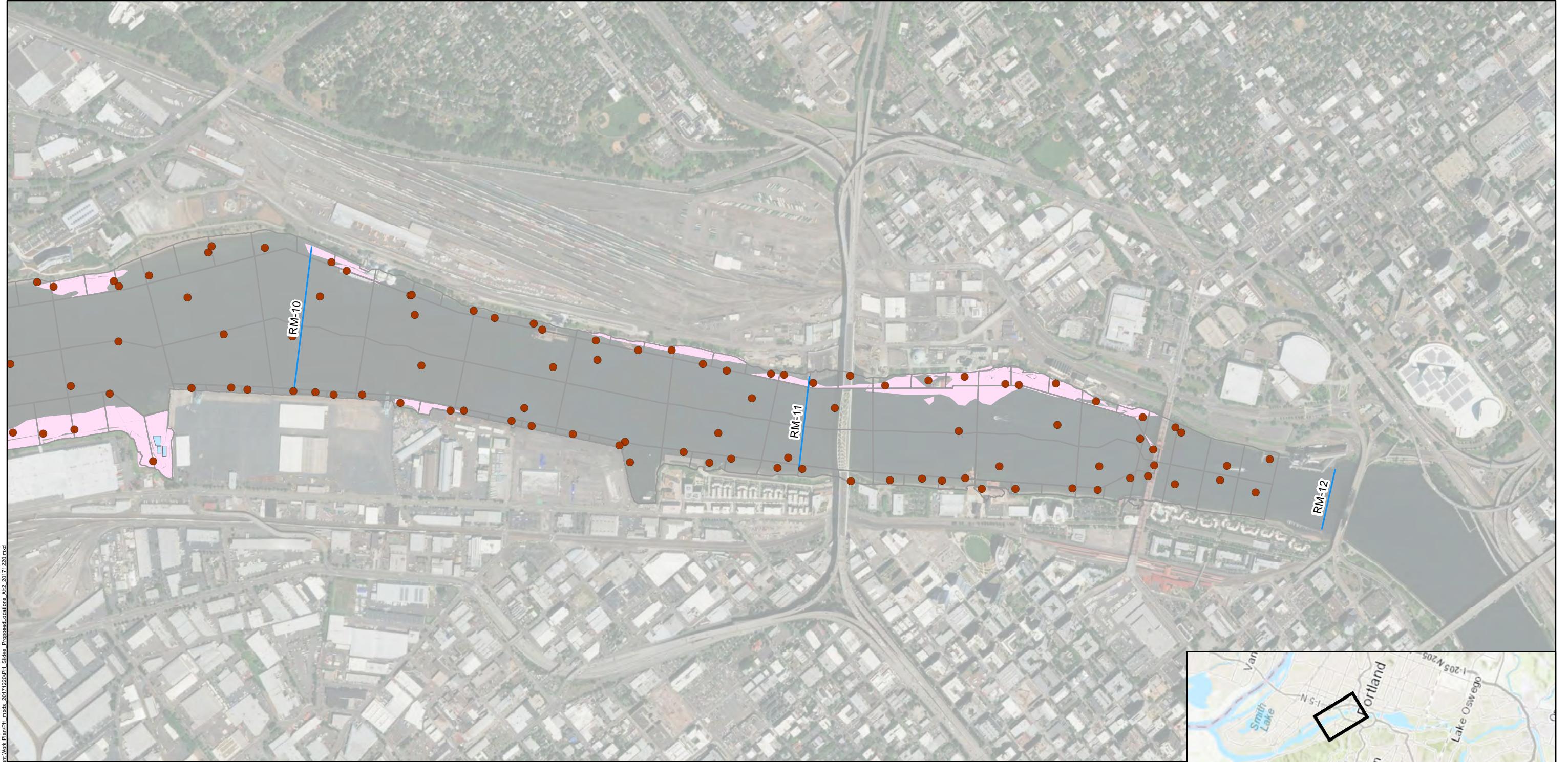
**Proposed Stratified Random Site Sample Locations  
(Alternate 2)  
RM 8 to 10**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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consultants

Figure

6d

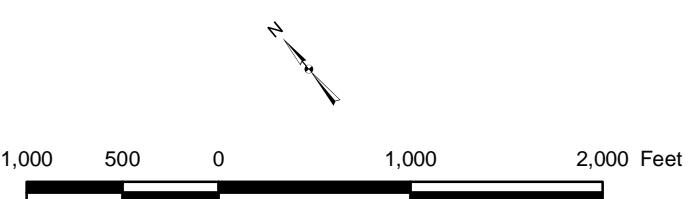


#### Legend

- Stratified Random Samples (n = 428) — River Mile Marker
- Randomized Sample Grid Cells
- Capped Area (Existing)
- Alternative F Mod SMA Footprint

#### Notes:

1. Aerial Imagery provided by ESRI Basemaps 2017.
2. Surface sediment samples are defined as the 0-30 cm depth.
3. n - sample count, RM - river mile, SMA - Sediment Management Area.



**Proposed Stratified Random Site Sample Locations  
(Alternate 2)  
RM 10 to 11.8**

Portland Harbor Superfund Site  
PDI Surface Sediment FSP

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Figure

6e

## **APPENDIX A**

---

Field Forms and Checklists

## Sediment Sampling Equipment Checklist

### Safety Equipment

boots, waterproof, steel-toed  
gloves, nitrile, heavy outer  
gloves, nitrile, thin inner  
hard hats  
hearing protection  
rain slicks  
safety glasses/goggles  
butcher apron or Tyvek for decon  
PFDs  
throw ring  
First-Aid Kit  
warm/dry clothes  
cell phone, fully charged  
bottled water  
snacks  
float plan

### Sample Handling

bowls, large, stainless  
spoons, small, stainless  
spoons, large, stainless  
bottleware, sample analyses specific  
sample labels  
sampler, grab sampler<sup>2</sup>  
sampler, core and tubes<sup>1</sup>  
core caps  
core catchers

### Tools

hacksaw<sup>1</sup>  
drywall blade, 6 inch  
ruler (12 inch/30 centimeter)  
measuring tape<sup>1</sup>  
rubber mallet<sup>1</sup>  
screwdrivers (Phillips, flat)  
siphon tubes<sup>2</sup>  
utility knife  
lead line (if not on vessel)

### Supplies

handheld GPS, fully charged  
camera  
gas for boat, if applicable  
keys for boat, if applicable  
white board, white board markers  
bags, plastic zip, gallon-size  
bags, plastic zip, quart-size  
duct tape  
electrical tape  
ice  
logs, field<sup>3</sup>  
field books  
paper towels  
pens, ballpoint, permanent<sup>3</sup>  
Sharpies, small and large  
trash bags  
zip ties  
4-inch pipe clamps  
core carrying box

### Decon Equipment

brushes, long-handled  
brushes, short-handled  
detergent, laboratory (e.g., Alconox)  
methanol/hexane in dispensing bottle  
(optional)  
nitric acid, 10% in dispensing bottle (optional)  
5-gallon buckets, or similar  
aluminum foil  
water, distilled in dispensing bottle

### Plans

Field Sampling Plan<sup>3</sup>  
Maps  
Health and Safety Plan

<sup>1</sup>Core Sampling Specific

<sup>2</sup>Grab Sampling Specific

<sup>3</sup>Write-in-rain or other waterproof paper/pens are recommended.

## Portland Harbor PDI Surface Sediment Sampling Log

Sample Location: \_\_\_\_\_

Sample Date: \_\_\_ / \_\_\_ / \_\_\_

GPS Location Code:	
Weather Conditions:	
Tide (CRD):	
Water Depth (ft):	

Sampling Personnel:

Sample Area (circle one):	Baseline/BL	SMA/In-water Core	Downtown/Upriver
Analytical Suite (circle one):	Full ROD Table 17	Four Focused COCs	

Sample Location					
Attempt #	Time	Coordinates		Accepted (Y/N); Photo (Y/N)	Recovery Depth (cm)
		Northing	Easting		

Sediment Description		
Moisture:	Density:	Color:
Minor/Major Constituent %:		
Structure:		
Odor/Sheen:		
Redox Potential Discontinuity (RPD):	cm	
Other:		

Primary Sample Information		
Sample ID	Time	Containers

QA/QC Sample Information				
Sample ID	Time	QA/QC Type	Containers	Primary Sample

EPA Oversight During Sample Collection?      No      Yes

Additional Comments			

# Portland Harbor PDI

## Sediment Sample Logging Key

**Visual Sediment Descriptions consist of the following:**

- Moisture content
- Density/consistency (estimated based on visual observation)
- Color (Munsell Number)
- Major/Minor Constituents
- Amount and shape of minor constituents and major constituent structure
- Sheen and odor
- Redox potential discontinuity

*Example:* wet, soft, olive green (GLEY 1, 5/10Y) clayey SILT, little sand, moderate shell fragments, and trace twigs and rootlets. Silt texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Slight odor and trace sheen. RPD 1 cm.

**Sediment Description Terminology:** Estimated based on visual observations

**Moisture Content**

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content, no visible water
Wet	Visible free water, probably above optimum

**Density: Visual Core Drive Penetration**

SAND or GRAVEL		SILT or CLAY
Density	Visual	Consistency
Very loose	freefall	Very soft
Loose	easy penetration	Soft
Medium dense	moderate penetration	Medium stiff
Dense	hard penetration	Stiff
Very dense	refusal	Very Stiff/Hard

**Color descriptions in Munsell Charts**

**MAJOR and Minor Constituent % (by weight)**

Core Logs	Percent	Field Logs
Trace (clay, silt, etc.)	0-5	not identified
Few (clay, silt, etc.)	5-15	Slightly (clayey, silty, etc.)
Little (clay, silt, etc.)	15-30	Clayey, silty, sandy, gravelly
Clayey, silty, sandy, gravelly	30-50	Very (clayey, silty, sandy, etc.)
GROUP NAME	> 50	GROUP NAME

**Other Minor Constituents: % (by volume)**

(i.e., shells, wood, organics, plastic, non-native debris)

Trace	0-5
Scattered	5-10
Moderate	10-30
Substantial	30-50
GROUP NAME	> 50

**Structure**

Stratified	Alternating layers of varied material/color at least 1/4" thick
Laminated	Alternating layers of varied material/color at least 1/4 mm thick
Blocky	Cohesive soil that can be broken down into smaller lumps
Spongy	Organic and compressible nature
Lensed	Inclusion of thin discontinuous layers of different sediment
Homogenous/Massive	Same color and appearance throughout
Fibrous	Stringy or rope like structure
Seam	1/16 to 1/2" thick
Layer	greater than 1/2" thick
Interbedded	Multiple beds within a unit
Rolls Easily	Play-dough like (plasticity observation)
Angular	Sharp edges
Subangular	Rounded edges
Subrounded	Well-rounded edges
Rounded	Smoothed, no edges

**Odor Descriptions**

none
trace
slight
moderate
strong

**Sheen Test- % coverage**

S.T. = Sheen test visual analysis	
none, trace	<2
slight sheen	2-15
moderate sheen	15-40
moderate to heavy	40-70
heavy	>70

**Sheen Test- Visual Description**

rainbow	multicolored
metallic	metallic gray-colored
florets	semi-circular and multicolored
streaks	long and flowing shape

**Other Sediment Descriptions Used**

Agglomerate	Fused-appearance, often vesicular
Clast/inclusion	Non-fused appearance
Xenoclasts	Clasts that have been moved
Fresh	No visible sign of decomposition or discoloration
Winnowed	Loss of fines
Slumped	Settled but intact
Pockets/balls	Semicircular to circular inclusion/deposit
Chunky	Mass of unidentified material

**Sediment Core Log Guidelines**

color or minor change
major sediment change
depositional change

**Core Acceptance Guidelines**

1. Desired drive/penetration depth is reached.
2. Core recovery is greater than 70%.
3. Core tube appears intact (no signs of blocking, bending).
4. Minimal sediment loss out the top or bottom (minimal winnowing).

**Grab Acceptance Guidelines**

1. No or minimal excess water leaking from the jaws of the sampler.
2. No excessive turbidity in the overlying water of the sampler.
3. Sampler did not over-penetrate.
4. Sediment surface appears to be intact with minimal disturbance.
5. Program-specific penetration (30 centimeters) has been achieved.

**NOTES:**

\*Classification of sediment on core logs is based on visual field observations.

Classification notes should not be construed to imply laboratory testing unless presented herein. Unified Soil Classification System ASTM D-2487 and Visual-manual classification method ASTM D-2488 for the description and identification of soils were used as an identification guide.

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